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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 January 16, 1921. No. 1
Personnel and Field Station (Jan. 1-15) Issue.

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PERSONNEL ITEMS

Dr. G. H. Coons, pathologist at the Michigan station and collaborator in the barberry eradication campaign in that State, is now in Washington in connection with the compilation of cereal disease and other plant disease survey data, for use in the preparation of the annual supplement to the Plant Disease Bulletin.

Victor H. Florell, assistant agronomist in charge of cereal experiments in cooperation with the California Agricultural Experiment Station at University Farm, Davis, Cal., arrived in Washington January 4 for the purpose of preparing his annual report and a manuscript on the cereal experiments which have been conducted during the past several years at Chico, Cal.

Stanley F. Husted, who was employed in the barberry eradication campaign in South Dakota in 1920 and who was then a student in the University of Illinois, died at Philadelphia November 2, 1921 of pneumonia. At that time Mr. Husted was a student in the School of Commerce of the University of Pennsylvania.

E. S. McFadden, formerly scientific assistant in cooperative cereal investigations on the Highmore substation, and who is now engaged in farming at Webster, S. Dak., writes that although 1921 was the driest year on record in his locality, cereal selections made at Highmore produced yields about double those of the varieties ordinarily grown in this section. He says that Acme wheat yielded 10 bushels per acre; Cole oats, 25 bushels; Odessa barley, 20 bushels; Advance rye, 25 bushels, and Alta corn, 35 bushels. Turghai proso, seeded July 1, yielded 24 bushels per acre with only one rain between seeding and harvest. These yields were all made on late fall plowing following small grains. McFadden ends his letter, "Does cereal investigations pay? I'll say so."

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VISITORS

Drs. Engelmann, Reese, and Albright, representing the DuPont Powder Co., called at the office January 5, to confer with Drs. Humphrey and Tisdale regarding the use of fungicides for the prevention of smuts and other cereal diseases. Arrangements were made for experiments to determine the efficacy of a new fungicide, the toxic principle of which is mercury.

Don Livingston, Commissioner of Agriculture and Immigration in South Dakota, was an office visitor January 3. Mr. Livingston is temporarily connected with the U. S. Grain Corporation, and will supervise the purchase of seed grain under the Russian Famine Relief Act, which includes an appropriation for seed purchases. While here he conferred with project leaders with reference to varieties of cereals suitable for sowing in the famine district of Russia and the sources from which these varieties can be obtained in the United States.

PUBLICATIONS

Department Bulletin 1014, "Effect of Date of Seeding, and Germination, Growth and Development of Corn," by E. B. Brown and H. S. Garrison, was received from the Government Printing Office January 10.

The revised edition of Farmers' Bulletin 827, "Shallu, or Egyptian Wheat, A Late Maturing Variety of Sorghum," by Benton E. Rothgeb, was issued January 5. This revision contains data on varietal experiments with grain sorghums at several stations to and including 1920.

FIELD STATION CONDITION AND PROGRESS

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins)(Dec. 21) All thrashing operations were completed on December 12. We were delayed by two or three rains, but the rice was not at all damaged. The yield was very good and, in the main, results are satisfactory. The weather has permitted farm work to progress rapidly, and we will complete plowing this week. All ditches on the farm have been cleaned, and we are now working on the outlets to the west.

We are having almost daily inquiries for Fortuna rice seed for next year's planting. Unfortunately, most of the seed offered contains some red rice.

I note in travelling through the country that most farmers are taking advantage of the good weather and are far advanced with their plowing. I don't remember another fall in which so much plowing has been done this early in the season.

INDIANA

Purdue University Agricultural Experiment Station. (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (Jan. 12) Mr. G. M. Smith gave two talks at Muscatine, Iowa, during Christmas vacation at his home. On Thursday, December 29 he addressed the Sweetland Grange. Over 200 people were in attendance.

Mr. Smith gave an illustrated lecture on the effects of the root, stalk and ear rots and methods for their control, emphasizing especially field selection and testing the ears by the improved rag doll.

On the following day, Mr. Smith addressed a meeting called by County Agent J. W. Merrill at his office. He discussed the methods used profitably to reduce the losses caused by root and stalk rots and described the breeding experiments of the United States Department of Agriculture and the methods of testing seed stocks in community testers which are being used by many county agents in Indiana, Ohio, and Illinois.

The work at Lafayette at this time consists essentially of the routine work of testing, classifying, and arranging the seed ears for the experimental field work next season. Physiological experiments are under way in the greenhouse. Special soil treatments and temperature studies are being made.

MINNESOTA

College of Agriculture, University Farm, St. Paul. (Barberry Eradication, Leonard W. Melander). A last drive was made to get all bushes removed so that we could start the New Year with a fairly clean slate. This was done on the assumption that the owners had removed the bushes before the frost, but failed to send us the certification removal card. This was found to be true in the case of 7 properties on which there were 171 bushes.

Educational work was carried on through several means. A circular letter enclosing a copy of Farmers' Bulletin No. 1058 was sent out to about 600 rural school teachers, who were to assign the bulletin as a reading lesson. To obtain information on possible locations of barberry in the area we are going to work next year, 15,000 life cycle cards were also sent to the teachers for distribution among the pupils. We have already received several cards giving us the desired information on possible barberry plantings. Each location will then be investigated next summer as the farm-to-farm survey covers that particular territory. In addition to this, a barberry demonstration was held at the Minnesota Crop Show which included the Minnesota Potato Growers Association the Minnesota Crop Improvement Association, and the Minnesota State Horticultural Society. This was held in the Minneapolis courthouse, December 13 to 16. The show attracted thousands of people from all over the State.

The indications now are that if the present plans mature, the campaign will receive additional substantial cooperation.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). (Jan. 16) Since the last report, this section of the country received a good rain, especially for winter time. Wheat that was yet alive should make good growth now. A large acreage that was sown in dry soil will probably germinate but what it will do is a question.

Supt. E. F. Chilcott left for Washington, D. C. on January 7.

Weather data for first half of January; maximum temperature, 63° on January 14; minimum, 10° on January 7; precipitation, 0.96 inch.

NORTH DAKOTA

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.)(Jan.16) The first half of January has been rather mild. Temperatures below zero were recorded on only six of the first fifteen days. Maximum temperature for the period was 40° on January 9; minimum, -25 on January 4; precipitation, .06 inch on January 9.

The flax in the greenhouse which has been given artificial light has been making rapid growth, the plants averaging 28.4 cm. high while those which have had sunlight only average only 13.8 cm. high. The gain in height of the plants receiving artificial light over the others seems to be more rapid at the present stage of development. During the last five days the lighted plants have made an average gain of 3.9 cm., while the unlighted plants during the same period have made an average gain of only 1.1 cm. Two blooms appeared today on lighted plants the first flowers to open though flower buds appeared over a week ago. The unlighted plants look as though they would not put out any flower buds for a long time.

The winter wheat is only partly covered with a light irregular layer of snow. The ground is frozen where exposed as well as under the snow. The wheat rows even where freely exposed are bright green and apparently still alive.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Jan. 15) The fields are still covered with a blanket of snow. Much of the snow which fell during November still remains on the ground which is an unusually long time for snow to remain in this section. It has been impossible to examine the fields and plats of fall-sown wheat since the first of December. However, the prospects of fall-sown wheat are exceptionally good.

The precipitation for December was 0.47 inch, all of which fell in the form of snow. The total precipitation for 1921 was 15.48 inches, compared with 16.61 inches as the average for 23 years, 1898-1920 inclusive. The total seasonal precipitation in 1921 (April 1 to July 31) was 10.13 inches, compared with 9.09 inches as the average for the same 23 year period.

The large machinery shed which was started in November was completed January 3.

IDAHO

Aberdeen Substation, Aberdeen (A. B. McClymonds) The former superintendent of the Aberdeen substation, L. C. Aicher, has reported the following yields from the wheat varietal experiment grown in duplicate fortieth-acre plats on irrigated land in 1921.

Variety	C. I. No.	Yield, bu per acre.
Federation	4734	79.7
White Federation	4981	72.7
Dicklow	3663	68.0
Early Baart	1697	63.8
Hard Federation	4733	63.3
Pacific Bluestem	4067	62.3
Marquis	3270	60.3
Regenerated Defiance	3103	58.3

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 1+ February 15, 1922. No. 2.
Personnel (Jan. 16-Feb. 15) and Field Station (Jan. 16-31) Issue
Report of Barberry Eradication Campaign, 1921.

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PERSONNEL ITEMS

Dr. C. R. Ball and C. W. Warburton were secretaries to subcommittees of the National Agricultural Conference, January 23-27, inclusive, Doctor Ball being secretary of Subcommittee 5c, Costs, Prices, and Readjustments in the Wheat Regions, and Mr. Warburton of Subcommittee 5c, Costs, Prices, and Readjustments in the Corn Belt.

Dr. C. R. Ball addressed the members of Farmers' Club No. 4, of Herndon, Va., and its Women's Auxiliary, on February 9, on "The Scope and Results of the National Agricultural Conference."

Gordon C. Curran, who has been in Washington for the past two months, assisting in tabulating data on barberry eradication, left on February 1 to assume the leadership of the barberry eradication campaign in Illinois, with headquarters at Urbana.

Dr. Sophia Eckerson has been appointed temporarily as pathologist, effective February 1, to assist in microchemical work at Madison, Wis., in connection with studies on resistance and susceptibility of wheat and corn to the wheat scab fungus. Doctor Eckerson will investigate the microchemical and biochemical aspects of wheat scab infection and the development of the disease in wheat and other cereals, and will carry on microchemical studies on wheat and corn plants attacked by wheat scab fungus in comparison with normal plants.

Dr. George N. Hoffer, pathologist in the cooperative investigation of corn root, stalk, and ear rot diseases at the Purdue University Agricultural Experiment Station, assisted by John F. Trost, was in charge of an exhibit illustrating progress in the work with these diseases, at the annual convention of the National Canners' Association, at Louisville, Ky., January 16-20, inclusive. On February 8, at Manhattan, Kans., Doctor Hoffer spoke before the Kansas Crop Improvement Association, during Farm and Home Week, on "Recent Work Relating to the Root, Stalk, and Ear Rots of Corn in Indiana."

Jenkin W. Jones, superintendent of the Biggs Rice Field Station, Biggs, Calif., who has been in Washington during the past several weeks, was called to Logan, Utah, on February 2 by the illness of his wife.

Miss Mary L. Martini, who has been under temporary appointment for the past several months, was appointed biometrical calculator, effective February 1, to compile and tabulate the results of important physiological and genetic studies on cereals.

Alden A. Potter, formerly of this Office, has been reinstated for temporary service so that he may cooperate with Prof. L. E. Melchers, of Manhattan, Kans., who is expected here on February 20, in the completion of important corn smut manuscripts.

Dr. R. D. Rands, former pathologist of this Office, writes that he left Java for the United States on December 5, expecting to return by way of the Straits Settlements, Burma, India, Egypt, and Europe. He will visit laboratories and important field stations in Italy, Switzerland, Austria, Germany, the Netherlands, and France. After arrival in New York late in March he will come direct to Washington, D.C. Since July 25, 1918, Doctor Sands has been conducting important and exhaustive investigations for the Dutch Government on the diseases of rubber and cinnamon trees in Java and Sumatra.

Dr. Arthur S. Rhoads, former laboratory and field assistant in cereal-disease investigations, was transferred on February 1 to the Office of Fruit-Disease Investigations.

Dr. E. C. Stakman left Washington on February 4 for Memphis, Tenn., to confer with F. J. Piemeisel, former pathologist of this Office, relative to proposed epidemiology studies on stem rust in Texas. From Memphis, Doctor Stakman returned to St. Paul, Minn.

VISITORS

F. W. Beier, Jr., agricultural statistician in Montana for the Bureau of Markets and Crop Estimates, was an Office visitor on February 2.

George I. Christie, director of the Purdue University Agricultural Experiment Station, La Fayette, Ind., who was in attendance at the National Agricultural Conference, consulted with members of the Office on January 28 with regard to cooperative cereal-disease experiments in Indiana.

Eugene B. Funk, of Bloomington, Ill., a delegate to the National Agricultural Conference, called at the Office on January 30 to confer regarding corn-root rot studies that are being conducted in cooperation with the Funk Bros. Seed Co.

Dr. Thomas F. Hunt, dean of the College of Agriculture, of the University of California, consulted with the cerealist and project leaders on February 1 regarding cooperative cereal investigations in California.

Thomas C. Roberts, of the Washburn-Crosby Company, Minneapolis, was in Washington February 6 to 10, when he discussed the milling and baking value of Kota wheat and other matters regarding spring-wheat production and improvement with Messrs Clark and Martin.

Dr. Franco Samarani, director of the Agricultural Bacteriological Experiment Station, at Crema, Italy, was an Office visitor on January 31. Doctor Samarani is especially interested in the fermentation processes which take place in silage.

W. O. Tuck, sales manager of the Corona division of the Pittsburg Plate Glass Co., consulted with Dr. W. H. Tisdale during the latter part of January regarding the use of certain mercury compounds for the control of cereal smuts.

Henry A. Wallace, managing editor of Wallaces' Farmer, Des Moines, Ia., and a delegate to the National Agricultural Conference, was an Office visitor on January 28 to confer regarding the new program of corn breeding investigations.

PUBLICATIONS

A manuscript entitled "Early Vigor in Maize Plants and Yield of Grain as Influenced by the Corn Root, Stalk, and Ear Rot Diseases", by James R. Holbert, et al., was transmitted on February 5 for publication in the Journal of Agricultural Research.

A short paper entitled "Some Results of the Sweet Corn Root-Rot Investigations", by Dr. G. N. Hoffer, in charge of cooperative investigations of the corn-root rot diseases in Indiana, has been approved for publication in The Canning Age.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs.) No report.

VIRGINIA

Arlington Farm, Rosslyn (J. T. Taylor). No report.

NEW YORK

Cornell University Experiment Station, Ithaca (H.H.Love). No Report.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler). (Feb.1)
The first really cold weather of the winter occurred here during the third week of January and continued through the rest of the month. The temperature went as low as zero. After the first day or two of cold weather a fairly heavy snow fell which protected the wheat during the remainder of the spell. We have not yet been able to learn how great the damage was to growing wheat over the State as a whole.

The cooperative crop reporting service of the State Board of Agriculture and Federal Bureau of Crop Estimates has recently reported the acreage and yield of the leading field crops. Corn averaged 30 bushels per acre on 6,096,000 acres; Winter wheat, 10.9 bushels on 3,155,000 acres; and oats, 20 bushels on 2,148,000 acres.

IOWA

Iowa State College, Ames (Barberry Eradication, R. H. Porter). No report.

ILLINOIS

State Entomology Building, Urbana (Barberry Eradication L. R. Tenon). Work in barberry eradication in the State of Illinois for the month of January has included the preparation of three reports and work on the preparation of a State report to be presented at the meeting Annuals of the State Academy of Science. Besides this, the publicity for one county listed for our summer's campaign has been prepared for mailing.

Barberry removals have included 441 bushes from 15 properties distributed among four counties, 34 bushes being removed from 5 properties in Cook County, 100 bushes from 7 properties in Dupage County, 11 bushes from 1 property in Kane County, and 296 bushes from 2 properties in Lake County.

INDIANA

Purdue University agricultural Experiment Station. (Jan.24)
(Corn Root, Stalk, and Ear Rots, G. N. Hoffer.

The Canners Convention at Louisville was attended by approximately 3,000 canners, brokers, and various other agencies. The United States exhibit was shown in the Armory and attracted much attention. Many corn packers were in attendance. The reports which they brought in show that the rag doll germinator has been used quite extensively with very gratifying results. The Illinois Canning Company is planning to test all their seed stocks this season and they are beginning the work this week. It was this company which was the first to install the improved rag doll apparatus two years ago and to again have them test their seed stocks by the same method is indicative of the results they have obtained. The Illinois Canning Company plants over 3,000 acres each year, with the exception of last year when they planted very little and used what tested seed stocks they had from the preceding year. When they feel justified in doing this work we can take it for granted that they have found it profitable.

The W. R. Roach Company of Michigan has doubled their germinator capacity this year and that means that they are going to have a large surplus of tested seed corn this season. This company reported that the chief value of testing seed corn comes from a larger yield, better quality pack, and increased good will among the growers. The Wabash Canning Co., the Gibson City Canning Co., the Fame Canning Co., and Sears & Nichols Canning Co., all of them big ones, are among the firms who are testing their seed stocks.

Certain seedsmen are taking much interest in this work. There is a big project on to establish a seed company in Iowa, which is headed by Mr. Chapman of the Renville County Seed Company of Minnesota. He is planning to erect a large artificial curing plant. This will be a mighty big factor in improving seed stocks for the canners. Of course, you are already acquainted with the work that the Connecticut Station is doing with the E. B. Clark Seed Company, one of our former cooperators whom we got interested. The Jerome B. Rice Seed Company in Michigan is also testing their seed stocks, and the manager of the seed farm states that he is planning to test every ear which will be used in his breeding plats.

All these developments have been stimulated by our root-rot investigations. When we see county agents in Ohio, Indiana, and Illinois taking up the work on a big scale and when we know that last year over 400,000 ears were tested by county agents in Indiana alone and, furthermore, that many farmers and vocational classes in agriculture have also conducted germination tests, the extent of which cannot be estimated, it is indicative of a healthy state of affairs which cannot help but contribute much to the furtherance of our investigations.

Purdue University College of Agriculture (Barberry Eradication, R.J. Hosmer). No report.

OHIO

College of Agriculture of Ohio State University, Columbus (Barberry Eradication, John W. Barringer). No report.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W.F.Reddy) No report.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

MINNESOTA

College of Agriculture, University Farm, St. Paul (Barberry Eradication, Leonard W. Melander. The work during January consisted in preparation of reports, publicity, and plans for the next season's work. During the first week of January a barberry demonstration was held at University Farm for those attending Farmers' and Homemakers' Week. There were about 300 people at this short course.

The first supply of Circular 188 was sent out to all county agents, county superintendents of schools, agricultural teachers, and others interested in barberry eradication. The demand has been greater than the supply in this State. However, all requests will be filled within the next month. All property owners who had barberry bushes on their properties will be sent a copy as soon as possible.

Plans for resurvey are under consideration, whereby the weed inspectors in all the counties where the farm-to-farm survey has been completed will be supplied with lists and locations of all properties where common barberry bushes have been found. These inspectors will cooperate in the removal of sprouts.

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman). No Report.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). No Report.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) No Report.

COLORADO

Agricultural College, Fort Collins (Barberry Eradication, C.D. Learn.) No report.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). No Report.

WYOMING

Cheyenne Experiment Farm, Cheyenne (A. L. Nelson). (Feb. 1). The month has been slightly below normal in precipitation. The 50-year mean is 0.38 inch and the record for 1922 is 0.32 inch. There has been a very cold period during which the temperature dropped to -22 degrees. The mean temperature for the month is 20 degrees, which is 5.9 degrees below the 50-year mean. The wind velocity has been rather high, but not excessive at any time. These climatic conditions have almost ruined the winter wheat crop at this station. It was in the process of emerging and the cold weather and winds have made it look very unpromising. There is a noticeable difference in the amount of soil blowing on land which was plowed rather late in the spring and that plowed early in the spring, the blowing being markedly less on the late plowing. This factor may be of considerable importance in the production of winter wheat in this region. The land seeded with the furrow drill also shows considerable resistance to the wind over that seeded with the common press drill.

The report on the season's work on the Dry-Land Agriculture Project is complete and work on the cereal report is under way. The following are the yields of oats and barley for the year 1921:

OATS

C.I.No.	Variety	Yields, bushels per acre: Disked Corn Stubble	Fallow	Average
165	Sixty-Day	43.5	33.5	38.5
459	Kherson	35.2	34.1	34.7
787	Richland	34.7	36.0	35.4
729	Albion	33.8	31.3	32.6
841	Nebraska No. 21	31.9	39.7	35.8
493	Golden Rain	28.8	27.2	28.0
492	Ligowo	26.6	26.3	26.5
731	Abundance	28.8	23.8	26.3
714	Silvermine	33.8	23.1	28.5
134	Swedish Select	31.3	26.3	28.8
619	Colorado No. 37	36.0	27.9	32.0
768	Black Tartarian	15.0	20.1	17.6
732	Banner	19.4	18.2	18.8
1524	Spring emmer	21.9	13.4	17.7
	Average	30.1	27.2	

BARLEY

	Two-rowed hulled:			
878	Black hull	19.4	21.3	20.4
658	White Smyrna	23.0	25.7	24.4
531	Hannchen	25.1	24.0	24.6
187	Svanhals	20.7	19.6	20.2
926	Horn	23.0	24.4	23.7
914	Italian	19.2	23.5	21.4
	Six-rowed hulled:			
937	Sanarel	26.5	20.2	23.4
690	Coast	21.3	22.3	21.8
927	Odessa	27.5	25.7	26.6
936	Trebi	24.6	24.0	24.3
1991	Flynn	21.3	22.7	22.0
638	Manchuria	19.6	13.7	16.7
1176	Meloy	23.7	20.3	22.0
	Six-rowed naked:			
1106	Black Hull-less	17.7	19.0	18.4
620	Himalaya	21.3	23.2	22.3
	Average	22.3	21.9	

In considering the above yields it should be borne in mind that the season of 1921 was unusually favorable to the early maturing crops, because of the excessive rains during June and the severe drought after July 4

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) No Report.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) No Report.

State College of Agriculture, Agricultural College (Barberry Eradication, George C. Mayoue) (Jan.1922). During the month no field work was performed. However, the time was spent in doing publicity work. Yearbook Separate No. 796, Farmers' Bulletin 1058, and Department Circular 188 were mailed to all of the County Agents, Boys' and Girls' Club Leaders, and County Superintendents of schools. Demonstrations on barberry eradication were given at the Tri-State Grain Growers' Convention, January 16 to 20, and at two meetings on the college campus.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (Feb. 2) The last half of January was the severest period of winter weather so far this winter. Temperatures below zero were recorded on twelve of the sixteen days. The minimum temperature for the period and for the winter to date -33 degrees, occurred January 22. Maximum temperature for the period was 32 degrees on January 27. Precipitation for the period was 0.22 inch, making the total precipitation for January 0.28 inch.

Of the flax in the greenhouse, 31 of the 56 plants given artificial light have bloomed already and flower buds have appeared on 16 more. Those not given extra light show no signs of putting out flower buds.

The severest blizzard of the winter occurred yesterday and last night. Here on the hill this morning the snow is blown off almost clean except around the shrubbery and small trees where the drifts are from 2 to 5 feet high.

Dickinson Substation, Dickinson (Ralph W. Smith) (Feb. 4) The month of January was somewhat colder than usual, the mean temperature being 6 degrees as compared with a normal of 10.5 degrees. There were 16 days during the month when the minimum was below zero. The minimum for the month was -27 degrees on January 1. The maximum was 36 degrees on January 9 and 13.

The snowfall this winter has not been heavy but enough to furnish a little protection to the wheat nursery most of the time and to wheat plats in cornstalks all the time since November 7. As a result of the blizzard on February 1, the snow is badly drifted in places, with only an inch or two on plowed land. The total precipitation for January was 0.32 inch.

There has not been much inquiry for seed of durum wheat this winter, indicating that the acreage of durum wheat will doubtless be much reduced this year unless there is a marked change in the relative price as compared to common wheat.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) No report.

Assiniboine Field Station, Havre (G. W. Morgan) No report.

State College of Agriculture, Bozeman (Barberry Eradication, H.E. Morris) No report.

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (Jan. 31) During the month we have had some exceptionally cold weather, the minimum reading for the month being -42 degrees on the 19th. This is the coldest that has ever been recorded at this station. It was intensely cold from the 11th of January until the 25, the average minimum temperature for this period being -19 degrees. A heavy snow fell on the 2d of the month and covered the ground to a depth of 8 inches. Another snow came the 17th of the month. This snow was accompanied by considerable wind which caused it to drift badly. From the 24th on the weather has been more moderate.

The following varieties of peas were hand picked for seed during the month: Arthur, Wellwood, Gregory, World's Prize, French June, and Kaiser field peas, and Dwarf Defiance, Admiral, Yorkshire, and Everbearing garden peas.

During the month 14,000 pounds of barley and oats were cleaned and 3,000 pounds of alfalfa seed was cleaned for farmers.

The Superintendent spent 5 days at the Idaho State Seed Show, one day in judging seed grain, and the rest of the time attending the meetings. A talk was given on the subject of "Experiment Stations."

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (Jan) The weather in this section has been unusually cold since December 19. The total precipitation for the calendar year 1921 was 12.65 inches. Four inches of this came as snow on November 19 and 20. This unusual snowfall of more than 3 feet was followed by a few days of warm weather which slowly melted the snow so that the precipitation was practically all absorbed by the soil.

A severe wind storm accompanied by some snow and unusually cold weather occurred on December 19 to 21. The lowest temperature recorded this winter was -8 degrees on January 18. There have been from 4 to 8 inches of snow on the ground since December 19. The mean temperature for January was 21.6 degrees, the lowest mean temperature for January recorded at the Station, except that for January, 1916.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones) No report.

Plant Introduction Station, Chico (V. H. Florell) No report.

Agricultural Experiment Stations, Davis and Berkeley (F. N. Biggs and W. W. Mackie. No report.

218 B. RUST INVESTIGATIONS
(Dr. E. B. Humphrey, Pathologist in Charge)

BARBERRY ERADICATION CAMPAIGN
(Dr. F. E. Kempton, Pathologist in Charge)

The campaign for barberry eradication in cooperation with the thirteen north-central wheat-growing states, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming, begun in the spring of 1918, has now completed its fourth year. Results for 1921 and for the 4-year period follow:

In 1921, all efforts were concentrated on the farm-to-farm survey, although a resurvey of cities and villages in the counties covered was carried on at the same time. An area equivalent to about 142 counties was completed. Of these, 23 counties in Minnesota were surveyed on funds furnished by that State. In the survey, 165,662 bushes were located on 5,053 properties. Of these, 100,659 were escaped bushes on 555 properties. A total of 199,647 bushes was removed from 6,317 properties. In the resurvey, 21,956 sprouts were found and eradicated, and numerous seedlings also were found.

Investigations have been started which we hope will give us a successful method of eradicating both mature bushes and seedlings by chemical means. Mature bushes, both with the tops of the bushes remaining and the tops removed, are being treated with various oils, poisonous chemicals, and chemicals that give off destructive gases. Studies are also in progress to find a gas-producing chemical that may be inserted into the ground among the roots to cause immediate and complete destruction. Seedlings and sprouts are being sprayed with chemicals that will cause them to wither and die immediately. This work is being pushed as rapidly as possible.

During the four years from April 1, 1918, to January 31, 1921, almost all cities, towns, and villages in the thirteen States of the eradication area were surveyed. All rural work is completed in Montana, Colorado, and Wyoming. An area of approximately 321 counties was covered in the original survey. Resurveys were made in a portion of these counties only. Every property on which barberries were found will need to be resurveyed next year. A total of 5,619,971 bushes was located on 49,926 properties. Of these 3,293,185 were escaped bushes on 2,362 properties. A total of 4,443,826 bushes was removed from 45,584 properties. Of the 1,176,145 bushes remaining on 4,362 properties, about 1,000,000 are escaped bushes, most of which are not eighteen inches in height, on three large escaped areas in Wisconsin. These figures include 10,000 bushes found and removed from 20 properties in cities and towns in North Dakota in 1917, which have not been included in previous reports. This work was done on State appropriations.

Table 1 gives a summary of the results by States for the period January 1 to December 31, 1921. Table 2 shows the results by States for the 4-year period, April 1, 1918, to December 31, 1921.

Table 1. Data showing results obtained in the barberry eradication campaign from January 1 to December 31, 1921

State	Number of properties having bushes					Number of bushes					Sprouts found and removed in the resurvey
	In cities and towns	In country: Escapes	In country: Total	Total properties	Cleared of bushes	In cities and towns	In country: Escaped	In country: Total	In both cities and country: Found	In both cities and country: Removed	
Colorado	31	9	52	83	85	607	14	299	906	1,212	630
Illinois	1,264	153	478	1,742	1,475	12,835	23,434	33,203	46,038	31,030	1,675
Indiana	55	36	119	174	165	263	1,732	2,312	2,575	2,424	608
Iowa	18	33	197	215	770	54	2,943	7,073	7,127	11,937	3,619
Michigan	288	62	256	544	654	3,409	18,217	28,220	31,629	27,602	144
Minnesota	56	33	211	267	270	630	2,641	7,143	7,773	8,022	5,265
Montana											
Nebraska	43	12	162	205	312	296	2,384	6,281	6,577	14,741	1,951
No. Dakota	31	1	55	86	86	293	150	1,925	2,223	2,223	276
Ohio	804	24	229	1,033	1,696	3,360	4,565	5,645	9,005	25,475	2,281
So. Dakota	9	32	145	154	119	299	5,168	9,550	9,849	8,803	655
Wisconsin	147	158	393	540	655	1,201	39,411	40,719	41,920	65,628	4,802
Wyoming	4	0	6	10	30	14	0	26	40	550	50
Total	2,750	553	2,303	5,053	6,317	23,266	100,659	142,396	165,662	199,647	21,956

Table 2. Data showing results obtained in the barberry eradication campaign from April 1, 1918, to December 31, 1921

State	Number of properties having bushes					Number of bushes					Sprouts found and removed in the resurvey
	In cities and towns	In country		Total properties	Cleared of bushes	In cities and towns	In country		In both cities and country		
		Escaped	Total				Escaped	Total	Found	Removed	
Colorado	1,499	19	97	1,596	1,593	19,172	1,411	3,376	22,548	22,457	3,226
Illinois	7,724	346	794	8,518	7,773	92,500	25,635	42,289	134,789	114,897	2,336
Indiana	3,136	55	472	3,608	3,574	75,288	4,173	12,446	87,734	86,342	2,460
Iowa	6,684	205	1,016	7,700	7,693	642,544	32,216	89,196	731,740	731,545	6,502
Michigan	3,874	905	3,625	7,499	5,566	39,360	76,960	131,916	171,276	119,878	189
Minnesota	6,778	215	1,001	7,779	7,737	588,734	53,569	152,574	741,308	741,087	15,427
Montana	152	1	43	195	194	6,577	[illegible]	8,105	8,682	8,671	4,515
Nebraska	3,078	17	265	3,243	2,907	71,296	3,185	12,338	83,634	82,934	3,276
*No. Dakota	474	1	145	619	619	14,080	150	3,035	17,115	17,115	491
Ohio	4,490	65	555	5,045	4,318	197,120	19,774	25,747	222,867	199,367	2,281
So. Dakota	381	65	289	670	576	22,223	14,407	23,812	46,035	38,908	1,568
Wisconsin	5,927	467	1,440	7,367	6,980	276,673	3,063,763	3,071,430	3,348,103	2,279,583	13,086
Wyoming	74	11	13	87	54	3,946	1	194	4,140	1,042	240
Total	40,171	2,362	9,755	49,926	45,584	2,049,513	3,295,185	3,570,458	5,819,971	4,443,826	55,557

*The results for North Dakota include 10,000 bushes found and removed from [illegible] properties in cities and towns in 1917 which have not been included in previous reports.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 14 February 28, 1922 No. 3
Personnel (Feb. 16-28) and Project Issue
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PERSONNEL ITEMS

W. E. Brentzel, assistant pathologist, who has spent part of the winter collaborating with Dr. A. G. Johnson, at the Wisconsin Agricultural Experiment Station, Madison, Wis., in the preparation of a manuscript on flax wilt and canker and in conducting some physiological experiments on flax with relation to its diseases, has completed his work and has returned to his headquarters at the North Dakota Agricultural Experiment Station.

John Downey was appointed unskilled laborer, on February 18, to assist in the grass garden maintained in connection with our cooperative rust investigations at Berkeley, Calif., under the direction of Prof. W. W. Mackie.

Dr. A. G. Johnson, pathologist, who was planning to arrive in Washington about March 1 for conference on the season's program in the investigation of imperfect and sac fungi, is delayed by the illness of Mrs. Johnson, who has just undergone an operation for appendicitis. He expects to be able to arrive in the latter part of March.

Dr. F. E. Kempton, pathologist in charge of barberry eradication, left Washington on February 18 for points in Ohio, Indiana, Illinois, Wisconsin, Michigan, Minnesota, Montana, Iowa, Missouri, Kansas, Nebraska, New York, North Dakota, South Dakota, Wyoming, Colorado, and Pennsylvania, for the purpose of conferring with workers in the barberry eradication campaign. He will be away until the end of March.

Dr. C. E. Leighty, agronomist in charge of rye and eastern wheat investigations, last week read galley proof of manuscript entitled "Natural Hyoridization of Wheat and Rye in Russia," by Professor Meister, of the Saratov Experiment Station, Saratov, Russia, which is to be published in the Journal of Heredity. This article was translated by Prof. N. I. Vavilov, Director of the Bureau of Applied Botany and Plant Breeding, in Petrograd, Russia, who, last year, spent a

a number of weeks in Washington in consultation with officials of the Department of Agriculture. The article describes the very unusual phenomena of the appearance, in 1918, of thousands of first-generation wheat-rye hybrids in plots of wheat on the experiment farm at Saratov, many of which produced seed, from the progeny of which different selections are being increased and compared.

Doctor Leighty recently has been appointed associate editor of The Journal of Heredity, published monthly by the American Genetic Association.

Prof. L. E. Melchers, head of the Department of Botany of the Kansas Agricultural Experiment Station, Manhattan, Kans., arrived in Washington on February 25 to consult regarding cooperative cereal disease investigations and to prepare a manuscript with A. A. Potter, on the results obtained in corn smut investigations.

Alden A. Potter, formerly assistant pathologist in smut investigations, has begun collaboration with Professor Melchers in the preparation of a manuscript on corn smut investigations.

Glenn M. Smith, who is conducting cooperative experiments at the Indiana Agricultural Experiment Station, on the control of corn root, stalk, and ear rots in sweet corn, writes that in the coming season he expects to plant about 1,000 ear rows of sweet corn for hand pollination, of which number about 900 are first-generation selfs.

Lee R. Tehon, formerly leader in the barberry eradication campaign in Illinois, has been appointed collaborator, effective March 1, upon the assumption of the leadership in that State by Gordon C. Curran.

VISITORS

Director G. I. Christie, of the Purdue University Agricultural Experiment Station was an Office visitor on February 25 to discuss cooperative activities in Indiana, including manuscripts in preparation and submitted.

B. M. Davison, director of the State Department of Agriculture, Springfield, Ill., visited the Office on February 16 to discuss quarantine provisions in the flag smut situation.

Dr. C. A. Mooers, director of the Tennessee Agricultural Experiment Station, was in conference on February 25 concerning the program of cooperative corn investigations to be begun this spring at Knoxville, Tenn., where L. S. Meyer will be the cooperative representative.

PUBLICATIONS AND MANUSCRIPTS

A cooperative manuscript entitled "1. Effect of Chemical Seed treatment on the Control of Bunt and on Seed Germination. 2. Rust-resistant Wheat Varieties," by D. E. Stephens, superintendent of the Sherman County Branch Station, and H. M. Hoglan, assistant pathologist, was submitted in January for publication by the Oregon Agricultural Experiment Station.

Galley proof of Department Bulletin 1046, entitled "Rust Resistance in Winter Wheat Varieties," by Professors Leo E. Melchers and John H. Parker, agents in cooperative rust investigations at the Kansas Agricultural Experiment Station, was read on February 21.

Department Bulletin 1011, entitled "Effects of Mutilating the Seeds on the Growth and Productiveness of Corn," by E. B. Brown, was issued on February 25.

Page proof of Department Bulletin 1039, entitled "Experiments with Cereals on the Belle Fourche Experiment Farm," by John H. Martin, was read on February 24.

Galley proof of an article entitled "The Experimental Basis for the Present Status of Corn Breeding," by Frederick D. Richey, was read on February 24. This will be published in the Jan.-Feb. number of The Journal of the American Society of Agronomy.

A brief note entitled "The Use of the Greenhouse in Corn Breeding," by Frederick D. Richey, will be published in an early issue of The Journal of Heredity. The galley proof of this note was read on February 24.

SALES TAX ON GASOLINE

UNITED STATES DEPARTMENT OF AGRICULTURE,
Division of Accounts and Disbursements,
Washington D. C.

December 12, 1921

Dr. Wm. A Taylor,

Chief, Bureau of Plant Industry.

Dear Doctor Taylor:

I am informed that the States of New Mexico and Oregon impose a sales tax on gasoline of 2 cents per gallon, while the States Arizona, Arkansas, Colorado, Connecticut, Florida, Georgia, Kentucky, Montana, North Carolina, Pennsylvania, South Dakota, and Washington impose a sales tax of 1 cent per gallon.

Under the decisions of the Comptroller the Government is exempt from the payment of all State taxes, and I am therefore bringing the matter to your attention in order that you may advise the employees of your bureau operating Government-owned motor vehicles in the States enumerated that the sales tax should not be paid in connection with purchases of gasoline for the operation of Government-owned vehicles, or vehicles operated by the Government in such manner as to place the Government in the position of the purchaser.

All accounts covering purchases of gasoline in the States mentioned should clearly indicate that the price charged is exclusive of tax; otherwise they will be subject to question by the General Accounting Office.

Very respectfully,

(Signed) A. Zappone

Chief of Division.

WESTERN WHEAT INVESTIGATIONS

J. Allen Clark, Agronomist in Charge, and John L. Martin, Agronomist

Milling and Baking Experiments

In connection with the varietal experiments with wheat conducted independently by this Office and in cooperation with different States at field stations in the western half of the United States, a large number of milling and baking experiments have been conducted during recent years. These milling experiments were found to be necessary for a well-rounded program of wheat improvement in order to determine flouring values of varieties newly developed.

The milling and baking experiments were first started in 1915 upon a uniform set of spring wheat varieties from eight stations in the Great Plains area. These milling experiments were conducted in cooperation with the then Office of Grain Standardization of the Bureau of Plant Industry in the milling laboratory operated at Fargo, N. Dak., by that office in cooperation with the Department of Chemistry of the North Dakota Agricultural Experiment Station. Since 1918, the laboratory has been located in Washington D. C. and the experiments have been conducted with the Division of Milling Investigations of the Bureau of Markets. Since 1917, samples of varieties from five stations in the Pacific Coast and samples of winter wheat varieties from additional stations in the western half of the United States have been included in the milling tests. Since 1920, samples have been obtained also from several of the State stations with which this Office has no official cooperation.

Table 1 shows the number of stations and the number of samples tested during the 7-year period from 1915 to 1921. In all, 1668 samples have been tested for their milling and baking value. The studies of 1921 samples are nearing completion and data should be in the hands of the field men within the next two months.

Table 1. The number of field stations furnishing wheat samples, and the total number of samples tested for milling and baking qualities in the 7 years from 1915 to 1921, inclusive.

Year	No. of Stations	No. of Samples
1915	8	120
1916	12	141
1917	19	237
1918	17	213
1919	17	228
1920	23	307
1921	27	422
Total in 7 years		1668

Unfortunately, these milling and baking experiments do not in any way, serve to determine the value of durum varieties for the manufacture of semolina, and finally macaroni. With the cooperation of the Pillsbury Flour Mills Co. of Minneapolis, other methods are now being studied to determine the value of durum varieties for these purposes. There has long been considerable commercial opposition from the macaroni industry to the rust-resistant red-kernelled Pentad variety, commonly known as D-5. It is claimed to make a darker and duller macaroni than Kubanka. The preliminary experiments which have been made show that not only Pentad, but the rust-resistant amber durum varieties, Acme and Monad, also produce macaroni of a poor color and are not well suited for its manufacture. Some commercial opposition has already been expressed against the Acme variety. The preliminary experiments have shown it to be only slightly better than Pentad, and Monad slightly better than Acme. Such other durum varieties as Kubanka, Arnautka, Peliss, and Minrum are found to be satisfactory as regards color. The environmental effects seem to be an important consideration as well as the varietal characteristics as the samples from several stations gave quite different results. Undoubtedly, the seasonal variation will also be an important consideration. Further experiments will be made on this important character in the durum varieties, and it is hoped that a method may be worked out whereby satisfactory experiments may be conducted yearly with durum varieties for semolina and macaroni making, as have been done for several years with both common and durum varieties for flour and bread making.

218 CEREAL DISEASE INVESTIGATIONS

(Dr. H. B. Humphrey, Pathologist in Charge)

218-E INVESTIGATIONS OF TAKE-ALL AND SNOW MOLD

(Dr. A. G. Johnson, Pathologist in Charge)

218-E-3 Take-all and Foot-rot Investigations

(Harold H. McKinney, Assistant Pathologist in Charge)

Indiana Agricultural Experiment Station (False take-all disease of wheat). Two hundred varieties of winter wheat are sown on infested soil near Wanatah, Ind., for studies on resistance. Harvest Queen is sown in every tenth row and used as a check on the disease. Notes taken by Dr. R. W. Webb on November 3 indicated that the plants would go into the winter in good condition.

Illinois Agricultural Experiment Station (False take-all). The same varieties used in Indiana are grown also on the experimental plats located on uniformly infested soil near Urbana City, Madison County. In addition to this series there is a date-of-seeding series involving six sowings of Harvest Queen and Wis. Bearded No. 2 Turkey. This series should give additional data on the influence of date-of-seeding on the development of false take-all. Sowings were made on September 20, October 1, October 12, October 19, October 27, November 11, and December 13, 1921.

Owing to the very mild autumn and early winter, all but the last seedings have emerged. Interesting data already have been obtained on plants removed from the different sowings at periods of one and two weeks after emergence. The greatest amount of and the most severe Helminthosporium injury takes place in the sowings made during the intervals of highest temperature. Very little or no infection occurs in the late sowings. These results are directly in line with controlled soil-temperature experiments.

An extensive series of inoculation experiments with pure cultures also is being carried out. All inoculations were made in small plats surrounded by water-tight galvanized iron frames which extend 12 inches below and 6 inches above the soil surface. The soil was disinfected with formaline some time previous to making the inoculations and sowings. All degrees of infection have taken place in the Helminthosporium plats but plants are free from any infection in the disinfected control plats. Considerable injury by field mice has occurred in some of these plats, but there is a sufficient number of uninjured plats to assure getting spring data on the false take-all disease if it develops in any of the inoculation plats.

Kansas Agricultural Experiment Station (Foot-rot disease of wheat). Field experiments are in progress near Abilene, Kans. This work involves an extensive varietal-resistance series, consisting of all the important varieties of winter wheat grown in the eastern and central States, a date-of-seeding series, fertilizer, lime, and inoculated sulphur treatments, and a

rotation series. Observations made on November 9 in company with Dr. L. E. Melchers indicated that foot-rot does not show up in the fall.

Oregon Agricultural Experiment Station (Take-all disease of wheat). A field infested with Ophiobolus graminis is being used for the experimental plats located near Corvallis. Numerous varieties of eastern and western winter and spring wheats, rye, and emmer are being tested for resistance. In addition there is a date-of-seeding series, also fertilizer, lime, inoculated sulphur, and rotation series. Up to date there are no indications of the disease.

Washington Agricultural Experiment Station (Foot-rot disease of wheat). The experimental plats are located near Spokane. Owing to the low rainfall in that region it was not practicable to sow wheat on soil which produced the disease crop last season. Fallowed land near an infested field was selected and infested soil was distributed over the experimental plats before sowing the seed. The winter wheat varieties important for Washington are included in the varietal series. In other respects the program is essentially the same as that given for Kansas and Oregon. Dr. F. D. Heald reports that the plats went into the winter in good condition with no indications of the disease.

Wisconsin Agricultural Experiment Station. Plat, laboratory, and greenhouse experiments with all the foot-rots, take-all, and the false take-all are being carried on in the Department of Plant Pathology of the University of Wisconsin. Infested field soil from all the foot-rot areas in several states was shipped to Madison where it was put in the enclosed quarantine plats. Susceptible varieties of winter wheat have been sown in these plats and comparative studies are being made. These studies will be carried on during the spring and summer. None of the plats, even those containing natural Ophiobolus infestation, showed any symptoms of any diseases of the foot-rot type.

Studies are being made with Ophiobolus graminis and Wojnowicia graminis, the two fungi found most commonly associated with the different foot-rots in the several states. Owing to the fact that the helminthosporium disease is complicated with the foot-rots in several states considerable work is being done with this organism. This work is not only throwing considerable light on the helminthosporium situation, but it is making possible a more complete understanding of the true take-all type of malady.

With the assistance of Mr. R. J. Davis, graduate student in plant pathology, a preliminary soil-temperature experiment with Ophiobolus graminis has been carried on in the "Wisconsin tanks." Soil was inoculated with pure cultures of the organism grown from a single ascospore isolated from a diseased wheat plant collected near Corvallis, Ore. This experiment shows that at favorable soil temperatures, the parasite produces a severe seedling blight and often kills the plant within 14 days after sowing. The greatest injury occurred in soil held at temperatures near 22° and 24° C. The characteristic blackening of the base of the seedling and the "plate" of mycelium are strikingly evident. Badly infected seedlings turn yellow just below the tip of the leaves and gradually the whole plant turns yellow and then a bronze color. Severe root rotting also takes place at favorable temperatures.

The seedling blight symptoms produced by Ophiobolus graminis are strikingly different from those produced by Helminthosporium sativum and Gibberella saubinetii as well as from the first symptoms of the false take-all.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 14 March 15, 1922 No. 4
Personnel and Field Station (March 1-15) Issue

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PERSONNEL ITEMS

Carl W. Bower, a student at the Kansas State Agricultural College, was given a temporary appointment on March 10, as field assistant to John H. Parker in the study of agronomic phases of corn disease investigations conducted cooperatively with the Kansas Agricultural Experiment Station at Manhattan.

J. C. Brinsmade, jr., left Mandan, N. Dak., on March 3, for Urbana, Ill., to collaborate with Dr. C. M. Woodworth, assistant professor in plant breeding at the University of Illinois, formerly in charge of cooperative flax breeding for wilt resistance at the Wisconsin Station, in the preparation of two manuscripts on flax breeding. Mr. Brinsmade expects to return to Mandan on or about April 1.

Warren N. Christopher was appointed collaborator, effective March 1, 1922, in the barberry eradication campaign conducted cooperatively with the Montana Agricultural College at Bozeman, Mont.

S. M. Dietz, in charge of the cooperative investigations of crown rust of oats at the Iowa Agricultural Experiment Station, arrived in Washington on March 14 to complete the preparation of a second manuscript on the results of these investigations.

J. R. Holbert, in charge of investigations of corn root, stalk, and ear rots in cooperation with Funk Bros. Seed Co., at Bloomington, Ill., was at the Illinois Agricultural Experiment Station at Urbana, on March 3 and 4, to make greenhouse seedings of strains of corn to be used in physiological investigations cooperative with Doctor Hottes.

Merle T. Jenkins, who has been stationed, during the past year, at Bloomington, Ill., in connection with the cooperative investigations of corn root, stalk, and ear rots at that point, visited the Iowa Agricultural Experiment Station on March 13 and 14, in company with Frederick D. Richey. Mr. Jenkins will be located at the Iowa Station in charge of the cooperative investigations being started there about April 1.

Karl P. Link, temporarily employed as field assistant in wheat scab investigations conducted cooperatively with the Wisconsin Agricultural Experiment Station, at Madison, Wis., resigned his position on February 25.

L. S. Mayer, assistant agronomist in corn investigations, left Washington on March 3, to spend several weeks with Dr. G. N. Hoffer and his associates, in the cooperative investigation of the root, stalk, and ear rots of corn, at the Purdue University Agricultural Experiment Station, La Fayette, Ind. While there Mr. Mayer will become familiar with the methods of detecting, by means of the improved germinators, the presence of various rots in seed corn and also the symptoms by which iron and aluminum poisoning of corn may be recognized. This information is being obtained in preparation for his regular work of corn breeding.

Under date of March 9, Mr. Mayer writes enthusiastically of the program of work undertaken with Doctor Hoffer, as follows: "Monday morning began my instructions and practice in plating kernels and making culture media. Next to come will be soil type reactions, both check and various fertilizer treatments, with respect to degree of acidity and susceptibility to deleterious free aluminum and iron compounds. After that will come some practice with the reagents used for the detection of those metallic compounds, and microscopic work in the identification of the more common causal rot organisms. Carrying on the testing of our own seed samples along with all this will keep me well occupied until I am ready to leave on Saturday, March 25."

Frederick D. Richey, agronomist, in charge of corn-breeding and cultural investigations, left Washington on March 12 to consult with officials of the Iowa Agricultural Experiment Station at Ames, concerning the cooperative corn investigations which are to be begun at that point this spring. On his return Mr. Richey will visit cooperative experiments now in progress in Illinois and Indiana.

Dr. E. C. Stakman, agent and pathologist, and Dr. F. E. Kempton, pathologist in charge of barberry eradication work, attended a conference, called by the Governor of Minnesota, at University Farm, St. Paul, on March 11, to discuss with State officials and representatives of business men in the spring wheat States the question of financial cooperation in speeding up the Government campaign to eradicate the common barberry, which spreads the stem rust of wheat and other cereals.

VISITORS

Dr. J. Arthur Harris, geneticist of the Carnegie Institution at the Station for Experimental Evolution, Cold Spring Harbor, Long Island, N. Y., was in conference on March 3 to discuss the results obtained in his investigations on osmotic pressures and electric conductivities of the juices of oats and spring and winter wheats grown at the Nephi Substation in Utah, and to arrange for material to be used in extending the investigations to other crops and at other points.

Dr. J. G. Lipman, director of the New Jersey Agricultural Experiment Station, was an Office visitor on March 3 to confer regarding various agronomic matters.

PUBLICATIONS AND MANUSCRIPTS

A manuscript entitled "Wild Rice," by Charles E. Chambliss, agronomist in charge of rice investigations, was transmitted March 7 for publication as a Farmers' Bulletin.

Manuscripts entitled "The Hard Red Spring Wheats," and "The Hard Red Winter Wheats," by J. Allen Clark, agronomist in charge of western wheat investigations, and John H. Martin, agronomist, were transmitted March 15 for publication in the Farmers' Bulletin series.

A manuscript entitled "Investigations of Heat-Canker of Flax," by C. S. Reddy and W. E. Brentzel, assistant pathologists, was transmitted March 9 for publication as a professional paper in the Department Bulletin series.

A manuscript entitled "Seedling Blight and 'Stack Burn' of Rice and the Hot-Water Seed Treatment," by W. H. Tisdale, pathologist in charge of smut investigations, was transmitted March 15 for publication as a professional paper in the Department Bulletin series.

A manuscript entitled "Studies in the Physiology and Control of Bunt or Stinking Smut of Wheat," by Horace M. Woolman, field assistant in cereal disease investigations, and Harry B. Humphrey, pathologist in charge of cereal disease investigations, was transmitted March 8 for publication as a professional paper in the Department Bulletin series.

Page proof was read of the manuscript entitled "1. Effect of Chemical Seed Treatment on the Control of Bunt and on Seed Germination. 2. Smut-resistant Wheat Varieties," by D. E. Stephens and H. M. Woolman, which is scheduled to be printed by the Oregon Agricultural Experiment Station as a cooperative bulletin.

FIELD STATION CONDITION AND PROGRESS

HUMID MISSISSIPPI VALLEY STATES (South to North)

ILLINOIS

State Entomologist Building, Urbana (Barberry Eradication, Gordon C. Curran). Since the arrival from Washington D. C. of Gordon C. Curran, the new leader of the barberry eradication campaign in Illinois, on February 4, he has been familiarizing himself with the details of the work and becoming acquainted with the corps of collaborators and others interested in the eradication of the common barberry.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) During the past two months, literature and mounts have been mailed to practically all of the high schools found in the two counties which are to be covered first in the farm-to-farm survey in the coming season. We have been fortunate in having the film "Barbarous Barberry" shown in several sections of these counties. A short time previous to the starting of the surveys in these counties we shall run a series of newspaper articles. With this amount of publicity, we feel that the residents will thoroughly understand the work and will be in a better position to cooperate.

The annual Michigan Farmers Week was held at the College the last part of the month. We were assigned twenty feet of space for a barberry demonstration. All phases of the work were emphasized, but special attention was given to local color. Maps of each of the counties in which the farm-to-farm surveys have been made were shown. These maps indicated the location of the bushes in the rural sections, also the name of the owner of the bushes was given, together with the number of bushes found in each location. When these maps were examined by the farmers, there was never an exception to the statement, "I never would believe that there were so many of those bushes right out in the farming sections."

MINNESOTA

College of Agriculture, University Farm, St.Paul (Barberry Eradication, Leonard W. Melander). No field work was performed during the month of February in this State. However, considerable effort was directed toward getting the rural school pupils on the alert for the common barberry bushes. Two hundred schools were supplied with Bulletin No. 1058 to be used as a reading lesson. Five thousand life cycle cards were also sent for distribution among the students. Eight hundred copies of Circular No. 188 were distributed to teachers, banks, and other places, where they can be utilized to good effect. A demonstration showing the characteristics of the common barberry was placed in the West Hotel, Minneapolis, for the benefit of the delegates to the Grain Growers' Convention. Lists of all barberry plantings found were made for the forty-eight counties in which the farm-to-farm survey has been completed. These lists are to be used next year by the State Weed Inspector's forces which will keep a constant watch on all these locations for sprouts and seedlings this coming summer.

GREAT PLAINS AREA
(South to North)

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (March 6). I have practically finished my winter's work at Manhattan, Kans., and expect to leave within the next two days for Akron, arriving there either Thursday or Friday of this week. A rather severe snow storm in that section may block trainservice.

During the past week I passed the final examination for the master of science degree. I also fulfilled the requirements as to the reading knowledge of scientific German. My thesis which covers from 140 to 150 typewritten pages is not yet typewritten in the final form. When completed it is my intention to forward a copy to the Office.

NORTH DAKOTA

Northern Great Plains Field Station, Manlan (J. C. Brinsmade, Jr.) (Feb. 17). The weather during the first half of February has been just about as severe as during the last half of January. Temperatures below zero were recorded on eleven of the fifteen days, and the mean temperatures were below zero on nine of these days. The average mean temperature for the period was one degree above zero; maximum temperature, 34° on February 7, which was the only time the temperature rose above freezing since the middle of January. The minimum temperature for the period was -23° on February 13. A precipitation of 0.27 of an inch was for the same period.

The lighted flax in the greenhouse still continues to develop more rapidly than the unlighted. All but five of the lighted plants have bloomed. Two of the five have buds that will be ready to open in the next few days. Two of the remaining plants doubtless would have bloomed before this time if they had not been injured by the cat.

The unlighted plants are growing well but slowly, and still show no signs of preparing to put out flower buds.

The winter wheat is only partly covered with snow. Where freely exposed the blades are frozen and have shriveled and turned brown to the surface of the ground. Where covered with snow the green blades project above the surface of the ground from one-fourth to one-half an inch.

The snow has drifted to a depth of seven or eight feet in some of the tree plantings, the bare ground showing in places where there are no trees, shrubs, or other obstructions to catch the snow.

(March 2) The weather was exceptionally severe during the last half of February. The maximum temperature for the period was 31° on February 16 and 17; minimum, -24° on February 25 and 26. The minimum temperature was below zero on all of the thirteen days, and the average mean temperature for the period and for the whole month of February was 0°. The mean temperature for the month of February was eight degrees lower than the average for the past eight years.

A precipitation of 0.45 of an inch was recorded for the last half of February and a total precipitation for the month of February of 0.72 of an inch. The snow which is well packed has drifted to a considerable depth in more places than previously reported.

The first ripe boll from the artificially lighted flax was harvested on February 27, and the seed was sown at once in the hope of getting another generation by June. The first bloom appeared on March 1 on one of the plants not treated with artificial light which was more than six weeks after the first blooms appeared on the lighted flax.

At least some of the winter wheat is still green and apparently in good condition though it has not had the test of a real thaw.

A great rise in the temperature came with the first of March and the snow is melting rapidly today.

Dickinson Substation, Dickinson (Ralph W. Smith). The present winter has been unusually cold and the snowfall has been greater than usual. The mean temperature was below normal in November, December, and January, while the month of February was colder than any previous February in the history of this station. The mean temperature was 0.7 degrees below zero while the normal mean for the month is 11.4 degrees above zero.

The precipitation for February was 1.09 inches as compared to a normal precipitation of 0.45 inch. The precipitation since November 1 was 3.07 inches which is 1.35 inches above normal for the months, November to February, inclusive.

During the first half of the winter, still, clear weather prevailed, but during the latter half there have been frequent small blizzards. The worst storm of the season occurred on February 21 and 22, when the wind and snow combined with temperatures from zero to 12 below caused considerable loss of live stock in the Slope region of North Dakota. The loss of live stock was caused partly by a shortage of feed, and many head of stock were turned out on the prairie grass. This grass was shorter than usual because of recent droughts and when it became covered with considerable snow it was difficult for animals to obtain feed.

The covering of snow varies from six inches to about two feet and averages about 10 inches. Deeper snow is reported in adjoining counties.

Winter grain has been protected by some snow practically all winter, and, in spite of the unusual cold, it should come through the winter with more than the average percentage of survival.

Superintendent McCluer is expected to return from Washington during the coming week.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Feb. 11). The ground has been covered with a heavy blanket of snow since the latter part of December. Snow has fallen on an average of twice a week and since the first of January very little of it has melted. During that time there have been 18 inches or more of snow on the level but it has drifted.

All roads are practically impassible except for sleighs or skis. Cars and wagons can not get through. Roads perhaps would be entirely impassible if each new snowfall had not been packed before the next storm.

It has been impossible to examine the winter wheat plats since the early part of December, because of the covering of snow. At that time winter wheat was in exceptionally fine condition, and there is every reason to believe that it still is so.

I have done considerable work in the granary since my last report, but it has been impossible to mail any grain because of the condition of the roads. Progress on my annual report has been retarded, but the work is almost done. Mr. Osenbrug and I are on the program for a 30-minute talk before the Farmers' Short Course to be held at Moccasin on February 14 and 15.

(Feb. 25) During the month of February the weather has averaged much colder than that of the preceding month. The average minimum temperature for the first 25 days of February was four degrees below zero, while the average minimum temperature for January was five degrees above zero, making a total difference of nine degrees. On 13 days during the first 25 days of February the minimum temperature was below zero, while there were only 10 days during January when the minimum temperature was below zero. During February the minimum temperature was 26 degrees below on the 18th and 23rd.

The precipitation recorded for the month of February to date was 0.69 of an inch, while that for January was 0.67 of an inch, all in the form of snow. Most of this still lies on the ground, although some of it melted during January. The ground has been covered with snow almost ever since Thanksgiving.

It has been impossible to examine the winter wheat, but it doubtless is in fine condition.

WESTERN BASIN AND COAST AREAS
(North to West and South)

OREGON

Sherman County Branch Station, Moro (L. E. Stephens). We have had a few days of warm weather and the snow is practically all gone. Considerable damage was done to winter wheat by some extremely cold weather in February. There were several days with a strong east wind blowing and with temperatures from 11 to 15 degrees above zero. Over a large part of the county there was no snow covering at the time and the strong wind caused considerable drifting of the soil. On the Station, the leaves of the Turkey winter wheat are frozen back considerably, but I think but few plants are

killed. Some other varieties, however, have many plants that appear to be completely winterkilled. I believe, however, that in our varietal trial all varieties will have enough plants remaining so that it will not be necessary to do any reseeding. We shall be unable to determine that definitely, however, until we get a few days of warm weather and can ascertain if some of the varieties which appear to be winterkilled will recover.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). I took 14 days leave at Ogden on my way out due to sickness in the family. Mrs. Jones and son were doing nicely when I left Logan on the 22nd of February. I arrived here yesterday.

We are having rain at present and it does not look much like spring. January and February have been colder than normal for this section. The minimum temperature for January was 21 degrees and for February to date 23 degrees. The total precipitation for January was 2.79 inches, and for February to date 3.75 inches.

The rice market at present is around $2.50 per hundred for No. 1 paddy. Information I gathered today from those who should be informed on the subject say there is still a large percentage of the crop in first hands. This is held largely by the Rice Growers Association. Rice has been moving very slowly. The market at one time reached $2.70 per hundred but most of the growers were holding for $3.00.

The Sutter Butte Canal Co. have applications for water for 30,000 acres of rice in Butte and Sutter Counties to date, according to a news item in the Sacramento Bee of February 23. There is plenty of snow in the mountains, so water for the next crop should be plentiful.

C E R E A L C O U R I E R

Official messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 March 31, 1922 No. 5
Personnel (March 16-31) and Project Issue

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DATE OF ISSUANCE OF CEREAL COURIER

Beginning with the issue of April 10, the Cereal Courier will appear three times a month, namely, on the 10th, 20th, and last day of the month. Beginning with April 1, therefore, bimonthly reports are desired from all agronomic and pathologic field stations. These should be mailed promptly on the 15th and last days of the month.

PERSONNEL ITEMS

J. Allen Clark, agronomist in charge of Western Wheat Investigations, served as an expert with the conference on suggested changes in the official grain standards for wheat, March 27 to 30.

S. M. Dietz completed the preparation of his manuscript on the results of his investigations of the crown rust of oats and returned to Ames, Ia., on March 25.

John R. Fitzsimmons has been appointed field assistant, effective June 24, to lead in barberry eradication in Colorado, with headquarters at Fort Collins. He will report in Washington, D. C., before beginning his field work.

Donald G. Fletcher has been appointed field assistant, effective April 1, to assist in the rust survey, with headquarters at St. Paul, Minn.

Victor H. Florell, assistant agronomist in charge of cereal experiments in cooperation with the California Agricultural Experiment Station at University Farm, Davis, Calif., left Washington March 17 for Manhattan, Kans., to consult with officials of the Kansas Agricultural Experiment Station, before returning to California to continue his field investigations and experiment in the production and improvement of cereals.

Dr. H. B. Humphrey, pathologist in charge of Cereal Disease Investigations, addressed a meeting of farmers at Herndon, Va., March 16, on the subject of corn root, stalk, and ear rots and methods for their control.

Dr. A. G. Johnson, pathologist in charge of investigations of Sac and Imperfect Fungi, arrived in Washington on March 23 for a stay of two weeks, during which time he will be engaged in the preparation of manuscript and the consideration of matters pertaining to the cereal disease budget.

Dr. F. E. Kempton, pathologist in charge of the Barberry Eradication Campaign, returned to this Office on March 29 from an extended field trip during which he visited the cooperating agencies in Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Nebraska, South Dakota, and North Dakota to discuss plans for carrying forward the field work of the coming season. He attended the first meeting of the conference for the Prevention of Grain Rust at St. Paul on March 11. On March 23 and 24 he conducted a conference of the State leaders of the barberry eradication campaign at St. Paul, Minn., where detailed reports of last year's work were presented by the various State leaders and plans for this season's work were outlined in detail. Dr. E. C. Stakman also presented a resume of the epidemiology studies of the past season and outlined plans of cooperation for the coming year. Dr. W. W. Robbins, Botanist, gave a very comprehensive report of the ecological studies upon the distribution of barberries, viability and germination of barberry seeds, resistance of seedling barberries and 2-year and 3-year plants to mechanical injury, and on chemical and various other methods of killing barberry bushes.

An adjourned meeting, attended by leaders from the eastern group of barberry States, was held at Madison, Wis., on March 25, to examine greenhouse experiments that are being conducted by Doctor Robbins.

Dr. C. E. Leighty, agronomist in charge of Eastern Wheat Investigations, who has been a member of the Department committee on wheat grades, has been attending the conference on suggested changes in the official grain standards for wheat, which was held March 27 to 30.

L. S. Mayer, during his three weeks' sojourn at the Purdue University Agricultural Experiment Station, has tested samples of the self- and cross-fertilized ears of U. S. Selection 201 that will be used in connection with the corn-breeding experiments to be carried on at Knoxville, Tenn., in cooperation with the Tennessee Agricultural Experiment Station. Approximately 1,500 ears were tested, these ears having been grown last year at Burdette, Ark., and Arlington Farm, Va. The studies were made with the generous cooperation of Dr. G. N. Hoffer and his associates at Lafayette, Ind.

Mr. Mayer left Lafayette on March 25 for Rhinebeck, N. Y., where he will pack official property and household goods for shipment to Knoxville, Tenn. He expects to arrive in Washington en route, on April 1.

Prof. L. E. Melchers, head of the Department of Botany and plant pathology of the Kansas Agricultural Experiment Station, Manhattan, Kans., and agent in charge of cooperative investigations of rusts, left Washington March 16 for Brooklyn, N. Y., to confer with Dr. G. M. Reed regarding the completion of the final draft of a paper on varietal resistance of sorghum

to head and kernel smuts. From Brooklyn he went to the Connecticut State Agricultural Experiment Station (New Haven, Conn.), where he conferred with Dr. D. F. Jones, plant breeder, and Dr. G. P. Clinton, botanist, concerning work on studies of corn smut in connection with inbred strains of corn. On March 24 he returned to Washington to conclude preparation of manuscript. On March 28 he left Washington for Manhattan, visiting Cornell University and Ohio State University enroute, where he will give some illustrated lectures on studies of wheat rust and tomato diseases, and arriving at Manhattan about April 4 or 5.

Marion T. Meyers has been appointed field assistant, effective April 1, to assist in barberry eradication in Ohio, with headquarters at Columbus.

Emil H. Ostrom has been appointed field assistant, effective April 1, to assist in the rust survey, with headquarters at St. Paul, Minn.

Miss Pauline I. Pierson, stenographer at Berkeley, Calif., was married recently, and her name now appears on the rolls as Mrs. Pauline I. Pedley.

Dr. R. D. Rands, formerly employed as pathologist in this office, and for three years under contract with the Dutch Government to conduct important investigations on the diseases of rubber and cinnamon trees in Java and Sumatra, arrived in Washington March 20.

Dr. Arthur S. Rhoads, formerly laboratory and field assistant engaged in smut analyses, has accepted a position as pathologist at the Missouri State Fruit Experiment Station at Mountain Grove, Mo., effective April 6.

Frederick D. Richey, agronomist in charge of corn breeding and cultural investigations, returned on March 25 after an inspection of the corn breeding experiments conducted cooperatively with the Illinois and Indiana Agricultural Experiment Stations. At the Iowa Agricultural Experiment Station at Ames, he perfected arrangements during the week of March 13 for the beginning of corn breeding experiments that will involve an extensive study of the possibility of obtaining increased yields of corn by selection within self-fertilized lines, and of the best methods to use in breeding. The plans were formulated by Mr. Richey and Mr. Jennins of this Office, and Dr. P. E. Brown and Prof. L. C. Burnett of the Iowa Agricultural Experiment Station.

Howard W. Sechrist was appointed field assistant, effective April 1, to assist in the barberry eradication campaign, with headquarters at Ames, Ia.

Dr. E. C. Stakman arrived in Washington on March 27 for a conference on barberry eradication and rust epidemiology studies. He left on March 29 for Dayton, Ohio, where he will confer with Army Officers at the McCook Flying Field regarding cooperation in the use of aeroplanes for determining distribution of rust spores by air currents.

A. F. Swanson, in charge of cereal experiments on the Hays Branch Experiment Station, Hays, Kans., who has been at the Kansas Agricultural Experiment Station, Manhattan, Kans., for the past four months engaged in genetic studies on sorghum, has returned to his headquarters at Hays.

C. W. Warburton, who has been detailed again to supervise the distribution of the Farmers' Seed Loan funds at Grand Forks, N. Dak., left Washington

March 21 to start the preliminary work. He will be assisted by N. A. Olsen of the Office of Farm Management and Rural Economics, C. E. Miles of the Office of the Solicitor, who will be in charge of the legal phases of the work, and J. Cook, who will be the disbursing clerk.

VISITORS

Prof. L. A. Fitz, head of the milling division of the Kansas Agricultural College and Experiment Station, was an Office visitor on March 28. He has been in Washington for a conference on suggested changes in the official grain standards for wheat. He and President Coulter of the North Dakota Agricultural College were employed last summer to conduct an extensive investigation of the factors affecting grades of hard red spring wheat.

Harrison Fuller of Minneapolis, secretary-treasurer of the Conference for the Prevention of Grain Rust, called at the Office on March 25 and 27 to discuss the progress of the barberry eradication campaign, the plans for conducting it in the future, and the quantity of funds which could be utilized effectively, if made available from any source, with a view to shortening the time required to complete the survey and eradication. This permanent organization is the result of a conference called at St. Paul by Governor Preus of Minnesota on March 11, which included officials of the State departments of agriculture and other organizations in the spring wheat States. Mr. Fuller was accompanied by Messrs. C. W. Hunt, J. F. Reed, and W. F. Hill, presidents, respectively, of the Farm Bureau Federations in Iowa, Minnesota, and South Dakota.

P. J. Wester, formerly an employee of the Office of Foreign Seed and Plant Introduction at Miami, Fla., and more recently connected with the Philippine Bureau of Agriculture, was an Office visitor on March 30 to discuss milling machinery and milling methods which may prove effective in the handling of adlay, an edible form of the well-known Job's-tears (Coix lacryma-jobi) which Mr. Wester has been instrumental in developing as a cereal plant in the Philippines.

MANUSCRIPTS AND PUBLICATIONS

A manuscript entitled "The Alternate Hosts and Biologic Specialization of Crown Rust in America," by I. E. Melhus, S. M. Dietz, and Florence S. Tilley, was submitted in January for publication as a research bulletin of the Iowa Agricultural Experiment Station and is now in galley proof.

A manuscript entitled "Wheat Stem Rust from the Standpoint of Breeding," by Dr. H. K. Hayes and Dr. E. C. Stakman, collaborator and agent, respectively, of this Office, at the Minnesota Agricultural Experiment Station, was approved on March 20 for publication in the Proceedings of the West Canada Society of Agronomy (Winnipeg).

Two manuscripts entitled, respectively, "The Club Wheats" and "The Durum Wheats," by J. Allen Clark, agronomist in charge of Western Wheat investigations, and John H. Martin, agronomist, were transmitted on March 24 for publication in the Farmers' Bulletin series.

Page proof of Department Bulletin 1046, entitled "Rust Resistance in Winter Wheat Varieties," by Professors Leo E. Melchers and John A. Parker, agents in cooperative rust investigations at the Kansas Agricultural Experiment Station, was read on March 25.

RESUBMITTED MANUSCRIPTS

Seven manuscripts, previously submitted for publication in the Journal of Agricultural Research and not yet published when that Journal was suspended on December 1, 1921, by act of Congress, have been returned to the Office for disposition elsewhere. It has been decided to submit all of them with a view to publication as professional papers in the Department Bulletin series. This entails a great deal of labor, as it requires the preparation of new title pages, preparation of a summary for the editors, changing the numbers of the plates in text and elsewhere, revision of the inscriptions for plates, and the preparation of a letter of transmittal giving detailed information regarding the nature and value of the data presented in the manuscript. From March 29 to March 31, inclusive, those named below have been resubmitted.

A Cytological Study of Infection of Baart and Kanred Wheats by Puccinia graminis tritici, by Dr. Ruth F. Allen.

The Influence of Soil Temperature and Moisture on the Development of the Seedling Blight of Wheat and Corn Caused by Gibberella saubinetii (Mont.) Sacc, by Dr. James G. Dickson.

The Water Content of Barley Kernels during Growth and Maturation, by Dr. Harry V. Harlan and Merritt N. Pope.

Accumulation of Aluminum and Iron Compounds in Corn Plants and its Probable Relation to Root Rots, by Drs. G. N. Hoffer and R. H. Carr.

Production and Dispersal of Conidia in the Philippine Sclerosporas of Maize, by Dr. William H. Weston, Jr.

TRANSLATIONS

Supplementing the list of available translations of foreign papers on cereals and cereal diseases given in the Cereal Courier, volume 13, pages 12-15, 52, 69, and 225-226, the following translations are now available in the Bureau of Plant Industry Library:

Brefeld, O. Brandsporen nicht einzeln frei, sondern verbunden oder zu haufen vereinigt. (Smut spores not free, but connected, or forming groups.) Untersuch. aus dem Gesammt. d. Mykologie, heft XII, p. 174-176. 1895.

Derlitzki, G. Untersuchungen über Keimkraft und Triebkraft und uber den Einfluss von Fusarium nivale. (Investigations of germinating and growing power and on the influence of Fusarium nivale.) Thesis. Merseburg, p. 1-68. 1917.

Henning, E. Bidrag till kännedomen om den s. k. Gul-spets-sjukan hos sadesslagen. (Contributions to the knowledge of the so-called yellow-tip disease in cereals.) Medd. no. 179. Centralanst. forsöks-jordbr. Bot. afd. no. 15, p. 1-30. 1918.

---------- Berberis lagstiftningen och mykoplasmateorien. (The barberry legislation and the mycoplasma theory.) Tidskr. for Lantmän., p. 1-12. 1917.

---------- Lagstiftningen mot berberis busken med särskild hänsyn till frågans nuvarande läge i vårt land. Tidskr. f. landtmän. 1916. (The legislation against the barberry-shrub with special regard to the present status of the question in our country (Sweden). Lund, p. 1-15. 1916.

Mueller, H. C., and Molz, E. Weitere Versuche zur Bekämpfung des Steinbrandes beim Winterweizen in den Jahren 1914-15 und 1916-17. (Experiments to combat bunt or stinking smut in wheat during 1914-15 and 1916-17.) Fühling's Landw. Zeitung., 66: 417-427, heft 21-22. 1917.

Nishiyado, G., and Miyake, C. Monutane No Shodoku Narabini Ine-gomasa-Gare-byo No Yobo-ho. (Rice seed treatment and prevention of the helminthosporium disease.) Byochu-gai Zassni (Journal of Plant Protection), 5: 1-9 (593-712), no. 9.

Riem, E. Beizversuche zur Bekämpfung einiger Getreidekrankheiten. (Experiments with fungicides to combat some cereal diseases.) Illustr. Landwirt. Zeitung, 35th year, no. 24, p. 161-162. 1915.

---------- Ueber die Wirkung von Tetra-chlor kohlenstoff und Schwefelkohlenstoff-dämpfen auf die Keimfähigkeit einiger Samen. (On the effect of the vapors of tetra-chlor-carbon and bi-sulphate of carbon upon the germination of some seeds.) Mitth. aus. d. Kais. Biol. Anst. f. Landw. u. Forstw., heft 14, p. 25-26. 1913.

Sylven, N. Vad bör göras för det svenska linutsädets förbättrande? (What is to be done in order to improve the Swedish seed of flax?) Sveriges Utsädes för. Tidskr., 31: 57-69. 1921

von Tubeuf, C. Züchtung brandfester Weizen. (The production of smut-immune wheat varieties.) Naturwiss. Zeitschr. f. Forst u. Landw., 18: 290-311. 1920.

Wawilow, N. Beiträge zur Frage ueber die verschiedene Widerstandsfähigkeit der Getreide gegen parasitische Pilze. (Contributions to the question of the different power of resistance of cereals against parasitic fungi.) Arbeit d. Versuchs. f. Pflanzenzücht a. Moskauer landwirt. Institut. I. Moskau, p. 90-109. 1913.

PROJECT REPORTS

211 A 2. WESTERN WHEAT INVESTIGATIONS

J. ALLEN CLARK, Agronomist in Charge, and JOHN H. MARTIN, Agronomist.

Cooperative Investigations of Disease Resistance in Wheat.

These investigations are presented under two heads, namely, Seed stocks furnished for cooperative experiments, and Cooperative experiments in breeding for disease resistance.

Seed Stocks Furnished

In connection with the agronomic breeding and varietal experiments with wheat conducted independently by this Office and in cooperation with different States at several stations in the western half of the United States, a large number of samples of seeds of varieties and strains of domestic and foreign wheats have been furnished pathologists of the Office during recent years. Cooperative subprojects on breeding for disease resistance also are in progress with several of the pathologic projects of the Office, as discussed hereafter.

The seed samples furnished have been in connection with the investigations of wheat scab, take-all, leaf rust, stem rust, loose smut, and bunt or stinking smut. Cooperative breeding projects are under way to develop resistance to leaf rust, stem rust, and bunt.

For Stem-rust Studies. From 1915 to 1920, large numbers of domestic and foreign wheats were furnished for growing in the stem-rust nursery at St. Paul, Minn., formerly in charge of Mr. J. H. Parker, and more recently under the direction of Mr. Olaf S. Aamodt. During this 6-year period practically all spring wheats obtained by the Office were tested for resistance to stem rust. In the neighborhood of 3,000 different strains were tested.

For Leaf-rust Studies. Samples consisting of several hundred strains or varieties of both winter and spring wheat were furnished to Dr. E. E. Mains, Purdue University Experiment Station, LaFayette, Ind., for cooperative leaf-rust investigations in the seasons of 1920, 1921, and 1922.

For Loose-smut Studies. A limited number of samples of both spring and winter wheats were furnished to Mr. V. F. Taphe for loose-smut investigations at Arlington Farm in the season of 1921.

For Bunt Studies. All of the American wheat varieties used in the classification studies, and many of the foreign wheats, especially the Australian and Indian varieties, have been furnished for the cooperative investigations of resistance to bunt or stinking smut. The first experiment with these wheats was made in 1919 at Moro, Ore., when more than 800 rows were tested for bunt resistance. The next year seed of about 500 were furnished for similar cooperative experiments at Pullman, Wash., under the direction of Dr. E. F. Gaines and Mr. F. J. Stevenson; at Davis, Calif., under the direction of Messrs. W. W. Mackie and F. H. Griggs; and at Moro, Ore., under the direction of Messrs. H. M. Woolman and L. R. Stephens. In all, somewhat more than 2,000 seed samples have been furnished for these investigations.

Breeding for Disease Resistance

Stem-rust. Cooperative experiments in wheat breeding for resistance to stem rust at University Farm, St. Paul, are conducted by Mr. Olaf S. Aamodt, representing both the agronomic and pathologic projects of the Office, and who cooperates at Minnesota with Dr. H. K. Hayes, plant breeder, and Dr. E. C. Stakman, pathologist. The early breeding experiments for stem-rust resistance at St. Paul were conducted by Prof. John H. Parker entirely as a pathologic project. Since the agreement that all breeding for disease resistance should be done in cooperation with the agronomic staff, this has been a joint and cooperative investigation.

The most important problem in wheat improvement in the western half of the United States, is to originate adapted rust-resistant varieties. The discovery of numerous biologic forms of stem rust, however, has made this a very difficult problem. Information upon the distribution of different biologic forms is being obtained through a rust nursery, started in 1919, in which 22 varieties of spring wheat and emmer have been grown at a series of widely scattered experiment stations in the United States and Canada. During the past four years seeds for about 2,000 rows have been furnished each season. In spite of the handicap of so many different forms of stem rust, definite progress is being made in the breeding of rust-resistant varieties of hard red spring wheat. Since the discovery of the rust resistance in Kanred and Kota, these high-quality varieties of common wheat have been used as rust-resistant parents, which has made it unnecessary to rely upon the durum wheats for obtaining rust resistance. In the previous breeding experiments great difficulty had been experienced in obtaining desirable types of common wheat from crosses between durums or emmer and common wheats, because of the radical nature of the cross and the diverse types produced. By the use of the Kanred and Kota varieties, this difficulty, in a considerable measure, has been overcome. An extensive series of hybrids made between Marquis and Kanred in 1917 and 1918, with the object of producing a spring wheat with the qualities of Marquis and the rust resistance of Kanred, has produced promising material. Hybrid strains from this cross have been separated, which are resistant to the forms of stem rust to which Kanred is resistant. Selections from this cross with spring habit also are showing considerable promise, from a yield standpoint, in sections where stem rust is not a factor, as several of them have outyielded Marquis.

Crosses made in 1919 and 1920, between the rust-resistant Kota, and Marquis and Ruby, offer unusually good possibilities for obtaining the desired types. A large series of the F_2 plants of both of these crosses were tested in 1921, and significant differences in the rust resistance of the progeny were observed. A year's time has been saved with several crosses by growing F_1 or F_2 material in the greenhouse at Arlington Farm. F_2 plants of a cross between Kota and Hard Federation, made in 1920, are thus being grown, and a large series of F_2 and F_3 plants from this cross will be studied next year in the field. This cross combines varieties of common spring wheat having the greatest rust resistance and drought resistance, two outstanding and important physiological problems in the spring wheat area. Several interesting morphological characters also are combined in this cross, with which a special study is planned. Several other crosses for rust resistance have been made, including the cross of Kanred and Kota, which combines the two varieties that are resistant to many of the forms of stem rust. An attempt is being made to develop, synthetically, strains of spring wheat resistant to all biologic forms of stem rust.

The testing of progenies from these crosses, in large numbers, has just started, but the material will increase rapidly and during the next three years the facilities for handling the work should increase proportionately. In view of the seriousness of the rust situation, adequate funds should be furnished for properly carrying on this important work which is now so well started. The selections should be tested by the thousands rather than by hundreds. If this is to be done, additional funds will be absolutely necessary.

Leaf-rust. A breeding problem for leaf-rust resistance has recently been started cooperatively with Dr. E. B. Mains of Purdue University Agricultural Experiment Station, in the study of a cross between Kota and Kanred. About 2 dozen families of this cross, including both F_1 and F_2 material, were furnished Dr. Mains. These are the two varieties which are resistant to some of the biologic forms of stem rust. Kanred, however, is very resistant to leaf rust, while Kota is very susceptible to that disease. Material was furnished Dr. Mains for a study of the leaf-rust resistance of the progenies. Material of this cross will be grown at Fargo, N. Dak., and Dickinson, N. Dak., in addition to Lafayette, Ind.

Bunt or Stinking Smut. An office breeding project cooperative between Western Wheat Investigations and Cereal Smut Investigations was started in 1921, at Davis, Calif., under the supervision of Prof. W. W. Mackie, the details of which will be carried on by Mr. F. N. Briggs, assistant pathologist, and Mr. V. H. Florell, assistant agronomist. In the tests of domestic and foreign wheats for bunt resistance, two or three immune strains and several very resistant ones were discovered. These breeding experiments combine two of the immune strains, Hussar (C.I.No. 4845) and Martin (C.I.No. 4463), with the promising commercial varieties, Baart and Hard Federation. A genetic study of bunt resistance with these and reciprocal crosses is under way. The study embodies testing the F_1, F_2, and F_3 progenies of all possible combinations of these wheats for bunt resistance in comparison with the parents. Other crosses have been made for economic studies of bunt resistance, which are being carried on at Davis, Calif., Moro, Oreg., and Pullman, Wash. This work is not only cooperative between pathologic and agronomic projects of this Office, but is conducted in cooperation with the experiment stations of the States in which the work is located.

In Conclusion. These cooperative breeding projects with pathologists extend also to cooperation with State experiment stations, especially with plant breeders. The investigations, therefore, are planned to combine the problems of genetics and pathology with those of agronomy, and later to include those of milling and baking technology, with the hope of making possible the successful accomplishment of the desired results.

211 B. OAT INVESTIGATIONS

T. R. STANTON, Agronomist, Acting in Charge.

Coast Black Oats

In order to avoid confusing with other varieties of black oats, the name "Coast Black" has been adopted as the correct varietal name for the black oat grown in the Coast districts of California under the names Black, Commercial Black, California Black, etc. This name was suggested by Prof. George W. Hendry of the University Farm at Davis, Calif. As this oat apparently is restricted in its range exclusively to the central Coast district of California, it already is quite generally known to the grain trade of that State as Coast black oats, and it is believed that this name can be easily established.

It may be of interest to know that the Coast Black is a black form of the Avena sterilis group, very similar in all characteristics, except color, to the Red Rustproof or California Red variety. When grown at Ames, Iowa, and Aberdeen, Idaho, it behaves primarily as a winter variety, being very spreading in early growth. At Ames it fails to head entirely, while it usually heads at Aberdeen, as is true of other winter varieties when grown at that point, but rarely heads in time for the panicles to mature.

This variety was evidently introduced into California many years ago from northern Africa or other Mediterranean regions, as this Department has received from Dr. Trabut of Algeria, samples of red oats containing this variety as an admixture. It is grown for both hay and grain by the farmers of California, and from correspondence with several of them the fact has been brought out that it usually produces very high yields under their conditions.

211 A. CORN INVESTIGATIONS (230)

FREDERICK D. RICHEY, Agronomist
in Charge of Corn Breeding and Cultural Investigations.

The following tentative program is prepared with the intent of reorganizing investigations of corn to cover as adequately as possible, with present and prospective funds, the most important problems of corn production in the different producing areas.

BREEDING AND GENETIC INVESTIGATIONS

All experimental evidence indicates that the older methods of open-fertilized breeding of corn varieties are of little value in obtaining increases in productiveness, after a variety has become adapted. On the other hand, there is good evidence that methods involving selection within self-fertilized lines offer the greatest immediate practical possibilities in the production of higher yielding strains of corn. Furthermore, the fundamental problems of corn improvement can be solved only through investigations based upon self-fertilized lines. For these reasons, a program of corn-breeding investigations should concentrate principally on pure-line methods as a means of obtaining larger acre yields of corn, and the following program is concerned chiefly with such experiments. The suggested investigations with self-fertilized lines are considered in separate paragraphs for convenience. This does not mean that they necessarily are distinct. In fact, they are so interrelated that they should be carried on more or less simultaneously and with the same material, if the greatest progress is to be made.

Improvement by Selection within Self-fertilized Lines

A. The Problem. Obviously, the first practical problem is to determine what increases in yields can be obtained from breeding methods involving self-fertilized lines. Three possibilities should be considered. (1) F-1 crosses, or double crosses between pure lines made each year in combinations previously determined by experiment to be advantageous, (2) the synthesis of a high-yielding variety by recombining a number of pure lines from which deleterious characters in part have been eliminated by selection within self-fertilized lines, and (3) the selection of pure lines that are productive in themselves.

B. The Methods. Little or nothing is known yet as to what methods of selection are likely to produce the best results. The following concrete problems already have presented themselves and should be investigated. (1) Is it preferable to devote a given amount of effort to a few strains from each of a large number of original lines, or to the same total number of strains from a smaller number of original lines? (2) For how many generations must selection of self-fertilized lines be carried on before some significant measure of the value of the different lines can be obtained? (3) Are the valuable lines those that are the more productive under self-fertilization, or those that give the more productive crosses? (4) Can greater progress be made in the later stages of breeding by using definite combinations between strains already isolated, or by using new open-fertilized stocks as the basis for selection?

C. Studies of Fundamental Factors. The immediate practical project of producing higher-yielding strains of corn has been considered in the foregoing paragraphs. Of far more importance eventually is a thorough understanding of those morphological, physiological, and pathological variations that become evident in self-fertilized strains of corn, together with the mode of their inheritance. Too much emphasis cannot be placed upon the importance of studying these variations. They determine the adaptedness of a strain to its environment, its developmental vigor and its resistance or susceptibility to disease and insects. In short, these are the fundamental factors governing productiveness, and a knowledge of their effects and behavior in transmission is essential if corn improvement is to be placed upon a scientific basis.

Studies of Selection under Open Fertilization

A. Ear-row breeding. Certain varieties have been bred for productivenes under the ear-row system for nearly 20 years. It is desirable to continue some of this work in spite of the fact that it seems to offer little further in the way of increased yields.

B. Isolating Strains by Mass Selection. The results of about six years' selection of this kind with U. S. Selection No. 119, Boone County White, have been accumulated. These selections include strains having ears with different numbers of rows of kernels, and kernels with different indentations. It seems desirable to continue this work at least during the present season.

Varietal Experiments

Comprehensive varietal comparisons on a nation-wide basis do not seem justified because of the purely local application of the results. However, the Department should cooperate with various State agricultural experiment stations in their intensive and rather local varietal comparisons by insuring the inclusion of certain standard or key strains in such local experiments, and by arranging for desirable interstate experiments. Comparisons of first generation varietal crosses also are largely local in their application. They offer a possibility of obtaining increased yields, however, and should be carried on cooperatively at such points as arrangements permit.

Foreign and domestic sorts, especially those likely to have specific characters making them adapted to extreme conditions, should be sought for and studied to ascertain their value under different conditions and their desirability for use as breeding stocks.

Environmental Investigations

These studies cover the response of the corn plant to various factors in its environment, including temperature, moisture, competition, soils, tillage, fertilizers, rotations, etc. Investigations of some of these factors already are under way in connection with the studies of corn rots and other diseases. It is planned to study some others, in cooperation with appropriate agencies, as fast as funds permit.

Temperature. The relation of temperature to the germination and subsequent growth of corn is of extreme importance especially in the northern part of the United States. Investigation is being made of the effect of different temperatures on germination and growth of corn and of fungi attacking corn seedlings, and some results have been submitted for publication.

Competition. There is much information as to the best rates of planting for definite localities. Little is known, however, as to the response of different strains to varying spacings under given conditions of soil and season.

Soils. The relation of soil type to the presence and availability of toxic mineral substances and to soil infestation by fungi attacking corn is being given some study.

Fertilizers. The relation of specific organic and mineral fertilizers, singly and in combination, to the development of various rot-producing fungi, and to the availability of toxic metals, such as iron and aluminum, is being studied cooperatively in Illinois and Indiana. Comprehensive fertilizer experiments on corn, requiring large areas of land and large expense through many years, are not contemplated.

Rotations. Study of corn root, stalk, and ear rots shows a definite relation between severity of corn rot and wheat scab infection and the rotation followed. Doubtless rotation practices will be found to affect the development of other corn diseases, also. Rotation experiments, from these viewpoints, will be continued and expanded. No comprehensive rotation experiments, as such, are planned.

Physiological Processes. Some of the processes involved in the functioning of the corn plant in health and in disease are covered in part by the environmental studies already discussed. Others should be made the subject of cooperative research as rapidly and fully as possible. None of our important cereal crops is more susceptible to external influences than corn, and none should more fully repay such study.

PATHOLOGICAL INVESTIGATIONS

Fungous diseases of corn have been under investigation in the Office for several years. Among them are the various rot diseases, the downy mildews, the smuts, and the bacterial diseases.

The investigation of the very destructive corn rots is being conducted cooperatively in Indiana, Illinois, and Wisconsin, and has covered a study of the organisms; the diseases they produce; the relation of temperature, soil, crop rotation, etc., to the development of the organism and the disease; and the perfection of control measures, including elimination of diseased seed and breeding for resistance. In Indiana especial emphasis has been laid on the toxic effects of iron and aluminum in the corn plant and the relation of soil acidity to availability of these metals. The genetic studies under way in connection with disease resistance must be closely correlated with those outlined for agronomic improvement.

It is planned to take up an extensive investigation of corn smut in the near future, and here again it is probable that genetic research on resistant strains will be an important line of attack. This, too, should be closely correlated with the genetic studies on corn as a crop plant.

LOCATION AND PERSONNEL

The following suggestions as to location of the investigations and of personnel are based on the desirability of carrying forward the foregoing program of research, in the different important corn-producing areas, with present funds and men. The pathologic investigations are under separate supervision but are closely correlated with the agronomic studies and are listed to show the complete research program.

Administrative headquarters

Washington, D. C.

Administration. Fred D. Richey, agronomist in charge of corn breeding and cultural investigations; Dr. H. B. Humphrey, pathologist in charge of cereal-disease investigations.

Investigations. Field investigations at Arlington Farm, Rosslyn, Va. (which see); laboratory investigation of kernel and plant structure, germination phenomena, etc., as also of corn diseases.

Arlington Experimental Farm, Rosslyn, Va.

Breeding Investigations. Continued selection and recombination of self-fertilized lines of Gerrick, Cuban Yellow Flint, Porto Rican, Silver King (for earliness in South) now selfed for 2-6 generations; similar selection of U. S. Selection 201 (Whatley x St. Charles White), St. Charles Yellow, and Lancaster Surecrop also all selfed for 2-6 generations; selection of selfed lines of popcorn, and also ear-row selection; continued mass selection of different strains of Boone County White (Sel. No. 119), comparison of these strains and of crosses between them; continued ear-row breeding of U. S. Selections Nos. 119 and 120, and comparison of the F-1 cross Hickory King x No. 119 with No. 120 (Hickory King x 119 crossed in 1902).

Curtis H. Kyle and Fred D. Richey, agronomists, assisted by Harry S. Garrison and John G. Willier, assistant agronomists, and Hugo F. Stonecerg*, scientific assistant.

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*After another season of intensive training in selfing and selection, it is planned to place Mr. Stonecerg on an important cooperative station.

Varietal Studies. Study of varieties introduced from abroad and of domestic sorts about which more information is needed. Charles P. Hartley, agronomist.

Pathologic Investigations. Research on corn smut; limited study of root rots. Dr. H. B. Humphrey and Dr. W. H. Tisdale, pathologists.

Investigation in Southern States
C. H. Kyle, Agronomist in Charge

Pee Dee Substation, Florence, S. C.

Breeding Investigations. Selection and recombination of pure lines of Gerrick, Cuban Yellow, and Porto Rican. Selection for shuck protection against insects and fungi. Cooperation in local experiments. C. H. Kyle, agronomist, assisted by J. M. Hammerly, assistant.

Tennessee Experiment Station, Knoxville, Tenn.

Breeding Investigations. Selection and recombination of pure lines of No. 201. From the standpoint of increased yields, methods of selection and inheritance of physiological and pathological characteristics. Cooperation in local experiments. Fred D. Richey, agronomist, assisted by L. S. Mayer, assistant agronomist.

Pathologic Investigations. Limited studies of corn root, stalk, and ear rots. Dr. H. B. Humphrey, pathologist, Dr. S. H. Essary, botanist, and Dr. C. D. Sherbakoff, plant pathologist, Tennessee Experiment Station.

Investigation in the Corn Belt
Fred D. Richey, Agronomist in Charge

Purdue University Agricultural Experiment Station, LaFayette, Ind.

Pathologic Investigations. Extensive research on corn root, stalk, and ear rots, with especial emphasis on the relation of clay soils deficient in phosphates or lime or both, to the fungi causing corn rots and to the availability of iron and aluminum in toxic quantities. Also study of physiology of the corn plant in relation to these troubles.

Breeding Investigations. Selection and recombination of self-fertilized lines of Reid Yellow Dent and others to obtain disease-resistant strains.

Dr. G. N. Hoffer, pathologist in charge, assisted by B. H. Duddleston and Glenn M. Smith, agronomic assistants, and J. F. Trost, pathologic assistant.

Funk Brothers Seed Company, Bloomington, Ill.

Pathologic Investigations. Extensive research on corn root, stalk, and ear rots, with especial emphasis on control by elimination of diseased seed through improved germinator tests and on the field and laboratory symptoms by which infection is expressed in the different parts of the corn plant, including the ear. Also the relation of soil type and soil treatments, including lime and various fertilizers and rotations, on the prevalence and severity of infection by these diseases.

Breeding Investigations. Selection and recombination of self-fertilized lines of Funk Yellow Dent and Funk Ninety Day to obtain strains resistant to the organism producing the different corn diseases.

James R. Holbert, agronomist in charge, assisted by Benjamin Koehler, scientific assistant.

Illinois Agricultural Experiment Station, Urbana, Illinois.

Pathologic Investigations. Some phases of the work listed for Bloomington, Ill., are carried, also, in cooperation with the Experiment Station at Urbana, especially those relating to the effects of fertilizers and rotations, under the general direction of Dr. T. L. Burlison, chief in agronomy, and G. H. Dungan, associate in crop production. Physiological experiments in cooperation between the Department of Agronomy and the Department of Plant Physiology under Dr. Hottes are projected on an increasing scale.

Iowa Agricultural Experiment Station, Ames, Iowa.

Breeding Investigations. Selection and recombination of self-fertilized lines. Studies of the effects and mode of inheritance of physiological and pathological characters. This work to be based primarily on the best available strains of Reid Yellow Dent from Iowa and other States. In addition, available selfed lines of Silver King, Leaming, Lancaster, and other suitable varieties will be utilized. Also, cooperation in local experiments.

L. C. Burnett, agent and cereal breeder, Fred D. Richey, agronomist, and Merle T. Jenkins, scientific assistant.

Pathological Investigations. Limited investigation of corn root rots in cooperation with the Department of Botany. Dr. H. B. Humphrey, pathologist in charge of cereal disease investigations, and Dr. I. E. Melhus, pathologist, Iowa Agricultural Experiment Station.

Kansas Agricultural Experiment Station, Manhattan, Kansas.

Pathologic Investigations. Intensive research on corn smut; limited study of corn root rots. Dr. W. H. Tisdale, pathologist in charge of cereal smut investigations; Dr. L. E. Melchers, pathologist and agent; and Prof. J. H. Parker, plant breeder and agent, of the Kansas Experiment Station.

Northern Edge of the Corn Belt.

Varietal Experiments: Corn Yield Contests. A comparison of local and introduced varieties and strains with special reference to their productiveness under short-season conditions. Such a contest has been in progress in Iowa during the past two seasons and similar county contests have been conducted in Illinois. It is proposed to arrange for an interstate contest in that area forming the extreme northern edge of the corn belt, insuring that the best available strains in the entire district be included. A man with suitable training and experience is being sought to take charge of this work.

Investigations in Dry-land Areas
E. B. Brown, Agronomist in Charge.

Dry-land Station to be Determined.

Breeding Investigations. Selection and recombination of self-fertilized lines with a view to developing strains adapted to conditions of drought, heat, short season, heavy smut infection, etc. It is planned to establish field headquarters for the investigations in the Great Plains area. Ernest B. Brown, agronomist.

Cooperating Cereal Substations in Great Plains Area.

Limited experiments with corn on cereal projects are already in progress at the following points, under the assistants named: Woodward, Oklahoma (John B. Sieglinger); Hays, Kansas (Arthur F. Swanson); Akron, Colorado (Frank A. Coffman); Mandan (John C. Brinsmade, Jr.) and Dickinson, North Dakota (Ralph W. Smith); and Moccasin, Montana (Ralph W. May).

Northern Short-season Corn Areas.

It is planned to start cooperative investigation of corn improvement for the northern tier of States after July 1, if the appropriation is restored to its prewar normal. This territory stretches from New England to the Great Plains along our northern corner. It covers the Northeastern Section, including New York and New England, where the flint corns predominate for grain production, and the Northcentral Section, from Michigan to Eastern Dakota, where early dent varieties predominate for grain production.

Wisconsin Agricultural Experiment Station, Madison, Wis.

Pathologic Investigations. Important cooperative research is in progress on determination of Fusarium species which cause corn root rots and the related wheat scab and on the relation of temperature and soil moisture to germination and early development of the organisms and the corn plant. Dr. A. G. Johnson, pathologist and agent, assisted by Dr. J. G. Dickson and Miss Helen Johann.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 April 10, 1922 No. 6
Personnel (April 1-10) and Field Station (March 16-April 1) Issue.

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PERSONNEL ITEMS

Chas. E. Chamoliss left Washington on April 8 to visit experiment station officials at Athens, Ga., and Auburn, Ala., and the Crowley Rice Station at Crowley, La. He will also visit farmers interested in rice growing in those States and will spend some time at Crowley in connection with the conduct of the investigations at that Station.

Jonas J. Christensen was appointed as field assistant, effective April 6, to assist Dr. E. C. Stakman in rust epidemiology studies at University Farm, St. Paul, Minn.

J. M. Hamerly, assistant in corn investigations, left Washington on April 10 for Florence, South Carolina, where he will be stationed for an indefinite time at the Pee Dee Substation to supervise the necessary note-taking and cultivation in connection with corn breeding experiments that have been under way for several years. Among other things he will have charge of corn experiments which include crosses between pure lines of a variety that has been selfed for five generations.

Lyrel Johnston was appointed as field assistant, effective April 1, to assist in barberry eradication, with headquarters at Ames, Iowa.

Ernest A. Lungren has been given a temporary appointment as field assistant, effective April 1, to assist in barberry eradication, with headquarters at Fort Collins, Colo.

L. S. Mayer arrived in Washington from Rhinebeck, N. Y., on April 2 and, after spending a week in the preparation of his seed corn for planting, departed on April 10 for his permanent station at Knoxville, Tenn., to begin his new duties at the Tennessee Agricultural Experiment Station, where he will be in charge of the cooperative corn breeding experiments.

Raymond E. Menefee was given a temporary appointment as field assistant, effective June 1, to assist in barberry eradication in Indiana.

C. W. Warburton writes under date of April 3, from Grand Forks, N. Dak., concerning the progress of the seed loan work of which he is in charge: "Our work is well under way, as the blanks have now been distributed for the most part and applications for loans are just beginning to come in. The first checks were drawn Saturday, April 1, and a considerable number will be drawn today."

Ferdinand S. Wolpert was given a temporary appointment, effective April 1, to give the necessary supervision to the experiments that are being conducted on the control of flag smut at Granite City, Ill. He has been connected with these investigations in previous years.

VISITORS

President Butterworth of the John Deere Co., Moline, Ill., was an Office visitor on April 10 in the interests of more speedy eradication of barberries for the protection of the wheat crop.

Dr. H. W. Dye, formerly assistant professor of plant pathology, Cornell University, now pathologist of the Research and Development Department, Dosch Chemical Company, Inc., Louisville, Ky., was an Office visitor on April 7.

Dr. C. H. Eckles, chief of the Division of Dairy Husbandry of the Minnesota Agricultural College and Agricultural Experiment Station, who has been in Washington for conference on national dairy problems, was an Office visitor on April 4 to renew old acquaintances.

Harrison Fuller of Minneapolis, secretary-treasurer of the Conference for the Prevention of Grain Rust, was an Office visitor on April 8 and 10 to discuss the expansion of the campaign for barberry eradication and the pending appropriation bill providing funds for that purpose.

Prof. H. A. Honey, assistant professor of plant pathology, Cornell University, was an Office visitor on April 7.

Prof. C. B. Hutchison, formerly professor of plant breeding at Cornell University, was an Office visitor on April 6 to discuss cooperative cereal investigations in California. Prof. Hutchison is en route to Davis, Calif., where he becomes dean of the University Farm School.

MANUSCRIPTS AND PUBLICATIONS

A manuscript entitled "Trebi Barley," by Dr. Harry V. Harlan, agronomist in charge of Barley Investigations, Merritt N. Pope, agronomist in Barley Investigations, and Louis C. Aicher, formerly agronomist and superintendent of the Aberdeen (Idaho) Substation, was submitted on April 4 for publication as a Department Circular.

A manuscript entitled "The Common White Wheats," by J. Allen Clark, agronomist in charge, and John H. Martin, agronomist, Western Wheat Investigations, and C. E. Leighty, agronomist in charge of Eastern Wheat Investigations, was submitted on April 10 for publication as a Farmers' Bulletin.

Page proof of Department Bulletin No. 1062, entitled "Relation of the Character of the Endosperm to the Susceptibility of Dent Corn to Root Rotting," by John F. Trost, assistant pathologist of this Office, was read on April 6.

An article entitled "Flax," by A. C. Dillman, was approved on April 6 for publication in The Dakota Farmer, Aberdeen, S. Dak.

Four articles relating to cereals, prepared by members of this Office for inclusion in the "Agricultural Cyclopedia for Young People," were approved for publication on April 7. They comprise the following: Wheat, by J. Allen Clark and C. E. Leighty; The Story of Corn, by Harry S. Garrison; Rice, by Charles E. Chambliss; and Flax for Seed Production, by Arthur C. Dillman. An article entitled "Oats," by T. R. Stanton, was approved on April 8, for publication in the same work.

A paper entitled "The Wheat Bunt Problem in Oregon," by D. E. Stephens, agronomist and superintendent of the Sherman County Branch Station, Moro, Oreg., and H. M. Woolman, assistant pathologist in Smut Investigations, of this Office, has been issued as Bulletin 188 of the Oregon Agricultural College.

RESUBMITTED MANUSCRIPTS

Of the seven unpublished manuscripts returned by the Journal of Agricultural Research, five were resubmitted in March for publication in the Department Bulletin series and the remaining two have now gone forward as noted below.

A manuscript entitled "Early Vigor of Maize Plants and Yield of Grain as Influenced by the Corn Root, Stalk, and Ear Rot Diseases," by James R. Holbert, agronomist, Office of Cereal Investigations, W. L. Burlison, head of the Department of Agronomy, Chief, Division of Crop Production, Illinois Agricultural Experiment Station, E. Howard Biggar, formerly scientific assistant, Office of Cereal Investigations, Benjamin Koehler, assistant pathologist, Office of Cereal Investigations, George H. Dungan, associate in crop production, Illinois Agricultural Experiment Station, and Merle T. Jenkins, scientific assistant, Office of Cereal Investigations, was submitted on April 5 for publication as a professional paper in the Department Bulletin series.

A manuscript entitled "Investigations on the Rosette Disease of Wheat and Its Control," by Harold H. McKinney, assistant pathologist, was submitted on April 10 for publication as a professional paper in the Department Bulletin series.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). (March 30) The winter cereal crops are in excellent condition. Wheat and rye came through the winter with no freezing injury and are now in good vigor. In the experiments on rate and date of seeding wheat, the plats sown on October 29 are an exception, because the late fall weather allowed little growth and the wheat has not as yet started growing. The winter conditions were more favorable to barley than those of the past three years, and the varieties and new selections appear promising. Oats, though nipped slightly by late freezes, are now in good shape.

The wheat nursery of spaced plants suffered injury from the fall and winter weather. Some heaving has occurred, especially in the late-sown rows, and in the early-sown rows a severe infestation of dog fennel is present.

The greenhouse experiment, conducted by Drs. Leighty and Harlan on the influence of the length of day upon the growth of wheat and barley, is giving some interesting results. Observations on the plants are being made by Messrs. Sando and Pope.

The rainfall since January 1, 1922, has been very heavy, totaling to date 11.64 inches. Maximum and minimum temperatures to date for 1922 are as follows:

	Maximum	Minimum
January	62°	-2°
February	70	6
March	77	24

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). (March 14) During the winter the weather has been very changeable and at times there was considerable ice upon the winter wheat nursery. Just what effect this has had in winter killing it is too early to predict. The weather now is quite warm and if this continues a few days, growth will start on the fall seeding and we can soon tell something regarding the winter killing.

The seed is all weighed up for the oat nursery and the barley is now being weighed. The quantities to be seeded for both crops will exceed that of any previous year.

The crop that was seeded in the greenhouse is making good growth. This is particularly true of the crosses between Kubanka and the common wild and synthetic wild. Some of the varieties which were sown for further crossing have not been growing very rapidly. In the last few days, however, with more sunlight, growth is starting and crossing will soon be underway.

Mr. Craig has finished taking measurements on crosses made between polonicum and other wheat sorts. Measurements on the glume and kernel length have been made and other notes have been taken. He is now engaged in taking notes upon wild and common oat crosses preparatory to getting material ready for the hybrid nursery this spring.

As soon as the weather is settled we expect to begin the construction of a new $12,000 storage and threshing shed which will be adequate to properly store all the grains so that we will not suffer losses due to weather conditions.

(April 3) We are having considerable cool weather with snow and rain so that spring seeding will be later than last year, but possibly not any later than the average for the past ten years. If weather should be favorable we would not be able to start seeding for at least ten days. The oats and barley are ready for sowing, both at Ithaca and in the tests out in the State. There will be nine tests of oats, including thirteen varieties, in nine counties.

We have not had enough favorable growing weather yet to determine how the wheat has wintered. The hybrid series sown in the plant breeding garden looks fairly well, but on the farm, where there is always more freezing, we cannot yet determine the amount of injury.

The oats and wheat sown in the greenhouse for crossing are now beginning to head and some crosses already have been made. One cross in particular has been made between the tall type and the dwarf type of oat which occurred in our pure-line selection.

A rather extensive series of oat hybrids will be sown this spring, particularly to check up some color characters and the relation between the liguleless and wild characters.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Iowa State College, Ames (Barberry Eradication, R. H. Porter). No report.

Agricultural Experiment Station, Ames (E. G. Burnett). No report.

ILLINOIS

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran). No report.

Funk Brothers Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert.) No report.

INDIANA

Purdue University Agricultural Experiment Station (Corn Root, Stalk, and Ear Rots, G. N. Hoffer). No report.

Purdue University Agricultural Experiment Station (Leaf Rust Investigations, H. S. Jackson and E. B. Mains). No report.

Purdue University College of Agriculture (Barberry Eradication, R. J. Hosier). No report.

OHIO

College of Agriculture of Ohio State University, Columbus (Barberry Eradication, John W. Baringer). No report.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy). No report.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

Department of Agriculture, State Capitol, Madison (Barberry Eradication, Noel F. Thompson). No report.

MINNESOTA

College of Agriculture, University Farm, St. Paul (Barberry Eradication, Leonard W. Melander). (March 31) March was an eventful month at this station. Two conferences were held in the interests of the barberry eradication campaign. For the first one, the department here prepared a demonstration which showed every stage of the life cycle of stem rust. All the visitors were shown each stage in the order in which it occurs during the season. Progress maps and other demonstration materials were utilized also. The second conference was the State Leader's conference and was held here the 23rd and 24th of March.

Life cycle cards were sent out to the rural schools in southeastern Minnesota. The number of cards mailed this year totals 34,000. To date this office has received 50 reports of suspected plantings as a result. These reports will be investigated as the farm-to-farm survey progresses to where these reports apply.

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman). No report.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). No report.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker). No report.

Hays Branch Station, Hays (A. F. Swanson). (March 17) I returned to the Hays Station March 14 to take up the season's work.

The long dry spell lasting from August 13 to February 22 has at last been broken. The period of drought was too severe and much wheat at least in the vicinity of Ellis County either killed out or failed to germinate until the present time. It has been estimated that of the 200,000 acres of wheat in

Ellis County there is about a 25 percent prospect. Wheat from Salina east to Manhattan looks well.

Wheat that did not germinate last fall is now sprouting but it is a debatable question whether it will get up from the ground to head, or escape the summer drought at a later date.

Conditions are favorable for oats and barley. The experimental varieties will be seeded on the 20th. The ground is now being prepared.

We have had no soil blowing up to the present time. There is, however, some danger as yet from this source.

Moisture has been general over the State during the first part of March. The amount of precipitation from the last snow on March 9 at Hays was estimated at 1 inch.

(April 1) Since February 22 we have about three inches of rain, and the soil is in good condition for spring crops. The last ten days have been cool. At times the temperature has been below freezing.

The cool weather has probably benefited the late wheat, which did not emerge until after March 15. Most of the wheat in this section of the country which emerged last fall did not survive. That which was seeded after October 1 did not come up until March of this year. Under such conditions the stand is good. Some farmers are planting such fields to spring crops, however, as they fear that if the wheat is left it will be too late to mature a satisfactory crop. Other farmers are waiting with the idea that if the wheat does not look favorable they will substitute a row crop, such as sorghum or corn, at a later date. Most of the spring-sprouted winter-wheat area seems to be in the north-central part of the State.

Varietal oats, barley, and spring wheat were seeded on March 21 and 22 in fall-plowed ground. The seed bed was in excellent condition. The oats and barley sown in the date-of-seeding experiment of February 20 emerged on March 25. The tips of the leaves of the young plants were injured by freezing temperature but the effect is only temporary.

The experimental sorghum ground has been given a good disking to kill the young weeds and to start the remaining seed to germinate.

Prof. L. E. Call, head of the Agronomy Department of the Kansas State Agricultural College, was a Station visitor on April 1. He made a special study of the wheat conditions throughout this section of the State.

Last week considerable time was spent on the Cereal Project in taking notes and stand counts of the winter wheat, with particular reference to the spring sprouted plants.

COLORADO

Agricultural College, Fort Collins (Barberry Eradication, C. D. Learn, Col.)
No report

Akron Experiment Farm, Akron (F. A. Coffman). (March 25) Weather conditions are very favorable for spring seeding at the present time. Superintendent Brandon has practically completed the seeding of the plats of his office, and I

hope to start sowing the Cereal Investigations plats the first of next week. The soil is in excellent condition, and if the grain can be sown within the next week very satisfactory stands should result.

(April 1) The month of March has been dry and windy. Very little moisture was received during the entire month and practically none during the last three weeks of the month. Several days during the latter half of the month high winds were experienced and considerable soil-blowing resulted. While the damage was not great on the field plats, considerable damage was done in the nursery. At the present time the soil is becoming dry on the surface and moisture is needed very much.

During the last three days of the month the regular field plat experiments and the selection increase plats of spring wheat, barley, and oats were sown. A total of 275 plats of spring grain were sown, which, together with the winter wheat and rye plats, makes a total of nearly 475 plats of the small grains this season. With the seeding of corn, millet, and the sorghums the total number of plats in the cooperative Cereal Investigations experiments in 1922 probably will run close to 600.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). No report.

WYOMING

Cheyenne Experiment Farm, Cheyenne (A. L. Nelson). No report.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter). No report.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton). (March 29) The month of March was spent largely in publicity work. The greater part of the work was directed towards the first counties to be surveyed this spring. Five thousand bulletins and 1,600 circular letters were sent into six counties. Many personal letters have been written in answer to inquiries about barberries. Considerable interest has been aroused in the work by the Agricultural Instructors over the State who have cooperated heartily with this office.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (F. E. Brentzel). No report.

State College of Agriculture, Agricultural College (Barberry Eradication, George C. Mayboe). (February resumé) One hundred mountings consisting of specimens of common barberry were made and mailed to rural schools in different sections of the State. Bulletin 796 and circular 188 were mailed to all the first and second class high schools in the State. A circular letter enclosing circular 188 was mailed to all the county agents, home demonstration leaders, boys' and girls' club leaders, and superintendents of Experiment Station farms.

One thousand Life-Cycle cards were mailed to rural teachers. A demonstration and talk on the Black Stem Rust and its relation to the common barberry was given at Forman, Sargent County.

(March resume) During the past three months literature and mounts have been mailed to all of the first class high schools and to a few of the rural schools in the State. The film "Barbarous Barberry" has been shown at six community meetings, 10 rural schools and 3 town schools, one boys' and girls' club meeting, and one teachers' convention. A set of slides entitled "Black Stem Rust and the Common Barberry" has been shown at four schools.

No field work has been conducted during the past three months. However, one planting numbering 65 bushes was reported by the owner. This planting was found on a farm near White Earth, Mountrail County. That was the first find made in Mountrail County. Up to date common barberries have been found in every county in North Dakota except two, Bowman and Sioux.

Dr. F. L. Kempton, pathologist in charge of the Barberry Eradication Campaign, was here March 20 and 21. The State leader attended the conference of State leaders of barberry eradication held in St. Paul March 23 and 24.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). No report.

Dickinson Substation, Dickinson (Ralph W. Smith). (April 1) During the month of March the weather was rather mild and the snowfall light. This was quite a contrast to the unusually cold and stormy weather of February. The ground now is practically bare and the surface is thawing, so that field work should begin during next week if the warm weather continues.

It is too early to determine how much of the winter wheat is alive, but the indications are that more than the usual amount will survive the winter. Winter rye appears to be in good condition.

It is expected that more than the usual acreage of corn and potatoes will be planted in this section this year, and probably somewhat less wheat.

Seed for sowing in the nursery is being prepared in envelopes to be ready for use as soon as the plats are sown. The seed for sowing in plats was prepared last fall.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). (March 13) No precipitation has been recorded since the first of the month. A wet snow has been falling all day today, melting as rapidly as it falls on the bare spots, but remaining on the old snow. Since the first of the month there have been several warm days which melted a great deal of the snow but only small spots of ground were uncovered.

The maximum temperature since the first of the month was 52 on the 4th, and the minimum was 9 on the 8th.

Winter wheat is still in good condition, but the remainder of March and the early part of April will be a critical period for the wheat. The soil is soaked with moisture and a great deal of freezing and thawing probably will occur. There has been no runoff from the melting snow yet, but there is still danger from it.

The annual report for 1921, of the Judith Basin Substation, has been submitted to Dr. C. R. Ball, Cerealist in Charge of the Office of Cereal Investigations.

(March 31) The precipitation during March was 0.28 of an inch, which fell in the form of snow. Most of the snow has melted, but there are still a few small drifts scattered over the fields. There has been very little runoff from the melting snow and as a result the soil is thoroughly saturated with moisture.

As a rule the surface soil freezes during the night and thaws during the day, but there have been a few hard freezes during the month. Winter wheat has been in great danger of winterkilling during the past month, but fortunately it still appears in good condition. However, winter wheat is not yet beyond danger of winterkilling.

In the furrow drill experiments, the wheat which was sown with the ordinary drill is frosted a great deal more than is the wheat sown with the furrow drill. However, at the present time there appears to be a perfect stand of wheat under each method of seeding. The winter wheat nursery is also in excellent condition at present.

Maximum temperature for the month of March was 53 degrees on March 21; minimum, 4 degrees on March 26.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). No report.

WESTERN BASIN AND COAST AREAS
(North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds). No report.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). (March 30) We have started spring work, although the weather has been such that we have been able to do nothing but plow. The spring is much later than usual, as we generally get all our spring seeding completed before April 1. If weather conditions permit, we shall probably be through seeding this spring by April 10.

On the Station the only wheats that have winterkilled completely were some of the hybrid material in the nursery. All the wheats in the varietal trial have fair to good stands. Some varieties were thinned considerably by winterkilling and others were not hurt at all.

In this County there will be considerably more reseeding necessary than usual, but most of this is because of the failure of the late-sown winter wheat to emerge. There was some reseeding necessary on the light soils in the northern part of the County which was damaged from soil blowing early in March. On the higher elevations in the southern part of the County, considerable reseeding will be necessary because of the failure of the winter wheat to emerge. One farmer near Moro is compelled to reseed 600 acres of early-sown Turkey wheat because of damage done to the seed from treatment with formaldehyde.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). (March 31) The weather during March has been rather cold, windy, and stormy. Of the total precipitation of 1.64 inches, 1.30 inches has been recorded since the 15th. Maximum temperature

was 72 degrees on March 22; minimum, 32 degrees on March 11. There were only two days during the entire month when the temperature was 70 degrees or above.

Very little, if any, field work has been done on the rice fields this spring except on the new land, which can be worked much earlier than the old rice fields. It will be several days before the heavy adobe lands are dry enough to cultivate to good advantage.

The rice market remains about the same, varying from $2.50 to $2.60 per hundred pounds for No. 1 paddy.

Fall-sown wheat on rice land that has been fallowed for one summer looks very good at present. The dry winter was beneficial to wheat on the heavy soils, and apparently the cold weather did not affect it.

I met with the rice committee at Berkeley on March 12. The investigations with rice for this year will consist largely of control of water grass by irrigation. The land selected for this work is on the west side near Colusa Junction.

Agricultural Experiment Station, Davis (F. N. Briggs). (March 31) This has been a favorable season for grain at Davis, although the rainfall is about two inches below normal. The late rains, which have continued through March, have been especially favorable for the late-sown grain.

The cereal plats on the Station look better than they have ever looked at this time of year in the three years that I have been here.

The plats sown with seed treated with chemical dusts for the control of bunt look very well at this time. They show a higher percentage of germination and more vigorous growth than the control plats sown with untreated seed and seed treated according to the standard bluestone and formaldehyde methods. Greenhouse studies at Berkeley of the seedling stage of plants from this same series of seed treatments bear out this observation.

Agricultural Experiment Station, Berkeley (W. W. Mackie). No report.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 April 20, 1922 No. 7
Personnel (April 11-20) and Field Station (April 1-10) Issue.

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PERSONNEL ITEMS

Keller E. Beeson has been appointed field assistant, effective June 1, to take charge of the barberry eradication campaign in Indiana, with headquarters at Lafayette.

J. C. Brinsmade, jr., who has been at the University of Illinois for several weeks, collaborating with Dr. C. M. Woodworth in the preparation of a cooperative manuscript on flax-breeding experiments, has returned to his headquarters at the Northern Great Plains Field Station, Mandan, N. Dak. While en route he conferred with specialists at the Indiana and North Dakota Agricultural Experiment Stations. At Chicago, he consulted with Mr. Chas. H. Clark, formerly in charge of flax investigations in this Office.

Bernard B. Broushy was appointed field and laboratory aid, effective April 11, to assist Dr. W. H. Tisdale in cereal disease experiments at Arlington Farm. He died suddenly at 5 a.m. on April 12, having been in the service but one day.

F. A. Coffman, in charge of cereal experiments at the Akron Field Station, Akron, Colo., recently was elected to alumni membership in the society of Phi Kappa Phi by the Kansas Agricultural College. Membership in this society is based on scholarship.

Ralph U. Cotter, who was granted leave without pay on November 16, 1921, to pursue post-graduate study at the University of Utah, returned to duty in this Office on April 16 as leader of the barberry eradication campaign in Wyoming.

Dr. Harry V. Harlan, agronomist in charge of barley investigations, left Washington on April 16 to make detailed studies of numerous progenies of hybrid barleys at the Cooperative Testing Station at Sacaton, Ariz. He also will obtain records and material for the continuation of the physiological studies of the development of the barley kernel. He will remain at Sacaton until about May 20.

Robert J. Hosmer, formerly assistant pathologist of this Office and leader of the barberry eradication campaign in Indiana, resigned his position on April 15 with the expectation of entering the wholesale confectionery business in Lafayette, Ind. Mr. Hosmer is succeeded by Keller R. Beeson.

Merle T. Jenkins, who, during the past year, has been assisting Mr. J. R. Holbert in cooperative investigations of corn root rots at Bloomington, Ill., was transferred April 1 to take charge of the new cooperative project in corn breeding at the Iowa Agricultural Experiment Station, Ames, Ia.

Dr. A. G. Johnson, pathologist in charge of investigations of imperfect and sac fungi, with headquarters at the Wisconsin Agricultural Experiment Station, returned to Madison on April 11.

Merrill B. Kroft has been appointed field assistant, effective April 16, to assist in barberry eradication in Indiana. He served in a similar capacity last year.

Edmund B. Lambert has been appointed field assistant, effective April 6, to assist in rust epidemiology studies under Dr. E. C. Stakman, with headquarters at St. Paul, Minn.

Miss Tryphosa Small, clerk and type riter operator, assisting Mr. Curran, State leader in barberry eradication at Urbana, Ill., was granted leave without pay for three months, beginning March 31, because of illness.

Thomas R. Stanton, agronomist, acting in charge of oat investigations, was called to Grantsville, Md., on April 10, on account of the illness and death of his father.

Miss Frances M. Todd, clerk in cereal disease investigations, is taking a week's leave at Norfolk, Va.

MANUSCRIPTS AND PUBLICATIONS

A manuscript entitled "Wheat Growing After Fallow in Eastern Oregon," by D. E. Stephens, superintendent of the Sherman County Branch Station, Moro, Oreg., and agronomist, Office of Cereal Investigations, and Prof. Geo. R. Hyslop, Farm Crop Specialist, Oregon Agricultural Experiment Station, Corvallis, Oreg., covering cooperative investigations conducted at Moro since 1912, was approved on April 14 for publication as a bulletin of the Oregon Agricultural Experiment Station.

A manuscript entitled "Some New Varieties of Rice," by Charles E. Chambliss, agronomist in charge of Rice Investigations, and J. Mitchell Jenkins, superintendent of the Rice Experiment Farm at Crowley, La., and assistant agronomist, Office of Cereal Investigations, was submitted for publication on April 20 as a professional paper in the Department Bulletin series.

A paper entitled "Germination of Barley Seeds Harvested at Different Stages of Growth," by Dr. Harry V. Harlan, agronomist in charge, and Merritt N. Pope, agronomist, Barley Investigations, has been approved for publication outside the Department.

A two-column article entitled "Opportunities in Flax Raising," by A. C. Dillman, in charge of Flax Investigations, appears on page 510 of The Dakota Farmer of April 15.

An article entitled "Gymnoconia graminis (Arthur) Sacc. and D. Sacc. on Wheat in the United States," by H. H. McKinney, assistant pathologist, and Dr. A. G. Johnson, pathologist in charge of Investigations of Imperfect and Sac Fungi, was published in Phytopathology, 11: 505-506, Dec., 1921.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). No report.

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). (April 19) The growth of all winter cereals has been rapid during the past week. Abruzzes rye was the first to head on April 10 and a week later all the varieties of rye, with the exception of Rosen and von Rümker, C.I.No. 133, had begun to head. The Nakano Wase barleys also have headed, beginning about the same time as Abruzzes rye.

Some leaf rust has been noticed on rye, but as yet none has been seen on wheat. The plats under treatment for smut control are in good condition. The difference in vigor, plainly noticeable in some of the plats last fall, does not stand out so clearly at present. No spring difference in vigor is discernible in the experiment with seed treated by electricity.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). No report.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

ILLINOIS

State Entomology Building, Urbana (Barberry Eradication, Gordon C. Curran). (April 12) During the month of March plans were made for field work this spring. Barberry survey lists were checked over and the bushes which have not yet been removed were noted. It is planned to visit the properties on which barberries still remain in resurvey work during April in Cook, Dupage, and Lake Counties, Illinois.

A number of men who desire work as field assistants during the summer were interviewed and questionnaires were made out for the candidates.

In the latter part of March the State Leader attended the general conference at St. Paul, Minn. Plans were made at that time for the experiment of collecting rust spores by airplane under the general direction of Dr. E. C. Stakman at Chanute Field, Rantoul, Ill., and at Knox Field, Louisville, Ky.

Funk Brothers Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert). (April 15) Dr. W. L. Burlison spent April 4 at Bloomington in conference regarding plans for the extensive field experiments on the Agronomy South Farm, Roland Field, and the Davenport and Morrow Plots, much of the seed for which will be furnished by the staff at Bloomington.

Mr. J. R. Holbert addressed a large meeting of interested farmers on April 14 at Carlinsville, Ill.

At the present time everyone is busily engaged in completing the germination of the corn to be used in the field experiments this season.

Continued wet weather has delayed farm operations about four weeks. No oats have been seeded yet. The plats of spring wheat for wheat scab studies, which should have been sown a month ago, have not been seeded yet because the continuous wet weather has made it impossible to get out into the field.

INDIANA

Purdue University Agricultural Experiment Station (Corn Root, Stalk, and Ear Rots, G. N. Hoffer). (April 10) The work at Lafayette is progressing very well. Two crops of selfed lines and F_1 crosses of corn plants have been harvested in the greenhouse experiments and are now available for chemical analyses. Over 160 pots have been used in each series. Sixty of these have been used in temperature tanks each time.

The greenhouse beds have been used to test each selfed and crossed ear which has been considered for the breeding experiments this season. Approximately 5,000 ears of Johnson County White, Reid Yellow Dent, and sweet corn varieties have been studied in both the soil beds and in the modified rag dolls.

The selfed-lines and F_1 crosses to be used by Mr. L. S. Mayer at Knoxville, Tenn., have also been studied in a similar manner, and detailed germination records have been taken.

Mr. R. A. Weaver has been employed as an analyst by the Experiment Station. Mr. Weaver began his work on April 3 and will devote full time to making chemical studies of the plants being grown in the physiological experiments in the greenhouse.

The breeding and inoculation experiments this summer will use over twenty acres in the vicinity of Lafayette. Additional experiments at various points in the State in continuation of work started and under way the past two years, will be supervised again this year.

Mr. Trost is continuing his chemical studies on seed corn deterioration as influenced by root rot organisms, under the immediate supervision of Prof. G. A. Spitzer, Research Chemist of the Experiment Station. This experiment will be completed within the next two or three months.

Visitors during the past month have been Dr. A. G. Johnson, Dr. J. G. Dickson, and Mr. F. D. Richey.

More extensive seed corn testing is being conducted in Indiana this spring than ever before. Farmers throughout the State are demanding that this testing

work be done, and as a result organized community testing is under way in over fifty counties in the State. In most places a battery of two large-size (22-0 ear) germinators is being used.

The modified rag doll method is the one which has been adopted and is proving to be entirely satisfactory for this work. The testing work as a rule is supervised by the county agent and one or more persons are placed in charge of the preparation and reading of the dolls and handling of the seed ears. A nominal charge of from one to two cents an ear is made for the testing, and present reports indicate capacity loads at all the places.

Over 400,000 ears were tested last season in thirty counties in the State in community testers, but the demand by the farmers this season will probably more than double this amount. This figure does not include the hundreds of small-size testers which are being operated by individual farmers. No information is available as to the extent of this work.

Reports from county agents and extension men indicate a very satisfactory condition and a bright outlook for future testing work. The expense of installing the new community testers will be more than paid off in most cases this year.

The results of the testing work which is thus being carried on are serving to emphasize the recommendations which we have given for the selection of the best types of seed corn. When the farmers see the results of the tests and appreciate (a) the importance of proper selection of thoroughly matured ears from resistant stalks, (b) the reason for eliminating starchy ears, and (c) the reason for proper curing and storage of the seed ears, they will give more attention to these steps in corn culture and progress cannot help but be made. The germination test by the modified rag doll emphasizes these points. It is the reflection of the condition of the seed ears as affected by diseased stalks or the organisms attacking the ears themselves. These tests of well-selected and carefully-bred seed corn in many of the community testing plants serve well to tell the better-corn story to many farmers who have become interested during the past three years.

In addition, similar work is well under way in Illinois and Ohio, where a number of Farm Advisors are supervising community testers. Numerous canning companies and commercial seedsmen also are using the method to test their seed stocks this year.

Purdue University Agricultural Experiment Station (Leaf Rust Investigations, H. S. Jackson and E. B. Mains). No report.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy). (April 11) During the month of March, practically all efforts were directed toward publicity work. Material is now ready to be mailed to the farmers in the counties which will be covered first in the farm-to-farm survey. Special emphasis was placed upon the losses sustained from the rust, and the slight chance of not suffering a loss if the barberry menace was not checked. Attention is drawn also to the fact that there is an alarming number of escaped areas of barberries in Michigan, and work must be done immediately to check the increase of the number of these locations. We are not asking the property owners themselves in these counties to destroy all of the bushes found, as we have never developed the ability to convince the farmers, as a body, that

eradication of the barberry means grubbing it out and watching for sprouts and destroying these. Theirs is merely an idea of removing, and this usually is accomplished by chopping off. If we encourage them to destroy bushes at this time, we feel that many of these plantings will be missed when we do the farm-to-farm survey work. Naturally we expect their cooperation in removing bushes at that time, but the best results are obtained when the bushes are grubbed out under the supervision of a field assistant.

We are pleased to state that the State Department of Agriculture is doing more than merely endorsing the campaign. It has been difficult for the State Inspector of Nurseries and Orchards to devote the efforts of his limited number of assistants toward barberry work, because the shortage of funds for his office has practically eliminated all field work. The State Commission of Agriculture has made available an additional fund, which will make it possible for the Department to put a man and a machine entirely upon barberry work during the season.

The Michigan State Farm Bureau has promised its fullest cooperation, and with the assistance of this far-reaching organization we feel that the present season's work will see the barberry-free area in Michigan greatly enlarged.

Much might be said of the information gained from the conference held at St. Paul, Minn. I am certain that every State leader is awaiting the results of the extensive field experiments of Dr. Robbins, and may the day be at hand when we shall cease to trench twenty feet of hard clay after a lateral root!

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman). No report.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). (April 15) This calendar year has had more than its average rainfall to date, as the records show 1.02 inches for January, 0.96 inch for February, 5.08 inches for March, and 1.43 inches for April to date. Wheat that survived the winter is making rapid growth at the present time. The wheat acreage in this part of the State will be small, however, because of the dry weather during the fall and early winter months. There was practically no rainfall in 1921 after the first week of September. Wheat was not sown extensively and quite a percentage of that sown was blown out. A large acreage intended for wheat will be devoted to row crops.

More broomcorn seed has been sold at the station this year than in any other three years combined. There has also been a very brisk sale of grain-sorghum seed.

The first date-of-seeding plats were sown this morning, these consisting of Acme broomcorn, Sunrise kafir, and Dwarf milo. The soil is rather cool at present, and it is doubtful if good stands will be obtained.

The first part of April, including today, has been very windy. From April 3 to 9, inclusive, there was a measurable quantity of precipitation each day, amounting to 1.43 inches. The maximum temperature for April was 82° on the 12th; minimum, 35° on the 11th.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker). (April 8) Resumé of weather and crop conditions in Kansas for December, January, February, and March:

December:

During the first week in December there was a general snowfall of from 4 to 6 inches, with as much as 11 inches in the western third of the State. Temperatures were mild the first part of the week, but temperatures of 5 to 10° were reported the latter part. The outlook for wheat was discouraging, especially in the northcentral counties where there was no fall of moisture and where cold weather and drought caused severe injury to the crop, especially in late-sown fields. From 10 to 15 per cent of the wheat was not sown at this date in the southwest counties.

During the second week in December, mild weather prevailed with almost no fall of moisture. Wheat made a general improvement and in the eastern third its condition was satisfactory. In the western third only a small per cent of the crop had germinated, due to exceedingly dry weather. In the northcentral and northeast counties the crop was suffering from insufficient moisture and some of it had turned yellow or brown.

The third week in December, mild weather prevailed, with no measurable fall of moisture. Wheat in some sections showed a slight improvement or was holding its own. The crop was furnishing much less pasture than usual and in the western half was not up enough to make any pasture at all. The soil in all parts of the State was very dry and the principal rivers showed an especially low stage of water.

The coldest weather of the season prevailed during the fourth week, with no relief from a long dry spell in the wheat belt. Temperatures were as low as zero in some of the northern and western counties on December 23 and 24. Continued dry weather and low temperatures were detrimental to the wheat, and in the western half much of the crop was not yet up.

The minimum temperature at Manhattan for the month was 15° on December 24; maximum, 43° on the 1st. The mean maximum for the month was 43.7°; mean minimum, 25.2°. There was measurable precipitation on four days, which totaled only 3.4 inches for the month.

January:

First week. Weather was mild and very dry, with no fall of moisture. Temperatures of 7 to 15° above zero were general. Wheat was in poor condition in all the western half of the State, and in the northcentral counties many correspondents reported its condition as very poor. Dry winds and absence of precipitation were unfavorable factors. In the extreme southwest counties of the State, conditions were especially discouraging as only about 15 per cent of the crop had germinated. Wheat was reported as being in fair to good condition in the eastern half.

Second week. Rains totaling from 1/4 to 1/2 an inch fell over most of eastern Kansas and in the southwest and southcentral counties, but the fall in the central and northwest counties was so small that it did no good whatever. Temperatures of zero or 2 to 5° below occurred on the 5th. Wheat was largely dormant but in the eastern half of the State had a good color. In the western half not much of it was showing above ground, while south of the Arkansas River from Dodge City west, almost none of the crop was up and but little seeding had been done.

Third week. Mild dry weather prevailed. Continued dry weather was very unfavorable for wheat. In the central part of the State not more than 50 per cent of the crop showed above ground while in most of the western third and several northcentral counties, only 10 to 25 per cent was above ground. High winds did some damage in north-central and northwestern counties. Wheat was not furnishing much pasture anywhere, practically none in the western half of the State.

Fourth week. The coldest weather of the season occurred in Kansas, temperatures being below freezing almost continuously, and below zero on several days. The western half of the State continued to be entirely too dry for wheat, but in the Kaw Valley and south there was a snowfall of from 1 to 4 inches on the 18th. Unfavorable reports were received on the wheat crop in central and western counties, much of it was not yet up in the western half, and further damage to the crop resulted from cold winds and lack of moisture. Very little damage was reported from soil blowing or heaving.

Maximum temperature at Manhattan was 58° on January 4; minimum, 1° on January 19. Mean maximum, 38.6°; mean minimum, 28.2°. Measurable precipitation fell on two days, which totaled only 3.5 inches.

February:

First week. Eastern Kansas was favored with snow and light rains, but the western half was badly slighted and remained exceedingly dry. The Kansas wheat crop was reported as being in very poor condition over nearly all the western half of the State. Not 50 per cent of it was showing above ground in this section, and many western counties reported less than 25 per cent above ground. Wheat fields from Dodge City west and south were practically bare. Ground was being prepared for oats in the southeastern counties.

Second week. Wheat crop had another unfavorable week, no rain whatever having fallen, and abnormally high temperatures had a tendency to start growth when the ground was too dry to support it. On February 20 the thermometer registered 70° in many sections of the State but on the 13th zero weather prevailed in a few of the northcentral counties. High winds on the 8th caused considerable damage by soil blowing in the central and northwestern counties. The wheat crop was needing moisture badly in all parts, especially in the western half. Oat sowing was under way in the extreme southeastern counties.

Third week. Dry weather continued with temperatures down to zero in northwestern counties on the 19th. Wheat was turning green in the southcentral and eastern counties and was reported as in good condition in the southeast. In the western and northcentral counties most of the wheat crop was still dormant and very few green fields were reported. Oat sowing was about done in Montgomery and Labette counties.

Fourth week. The long drought in Kansas wheat fields was ended by the best fall of moisture the crop had had since it was sown last fall. There was a general rain on March 22, totaling from 1 to 2 inches in all the eastern two-thirds of the State. Snow fell on the 27th in the extreme western counties. Temperatures were quite high at the beginning of the week but close to zero the latter part. The Kansas wheat crop took on a new lease on life as a result of the splendid fall of moisture. Oats sowing which was well under way in the southeastern part of the State was suspended on account of the rains and consequent wet fields. Measurable precipitation fell on four days at Manhattan, and totaled 1.3 inches. The minimum temperature was 4° on February 13 and 28; maximum, 74° on February 21.

March:

First week. Kansas was well supplied with moisture as the result of snows which benefited wheat in nearly all sections of the State. Early in the week the weather was wintry, with temperatures of 5 to 10° below zero in the western counties. In the eastern third of the State the wheat was beginning to turn green and its condition improved noticeably. In the central and western third the crop was sprouting and showing signs of growth. In many fields the crop was not yet showing above ground. Farm work was practically suspended on account of wet fields and cold weather.

Second week. All of Kansas except the northwestern counties received an abundant supply of moisture which greatly improved the condition of wheat and furnished a much needed supply of water in the soil for the growing season. Heavy snows fell in some sections of the State on the 13th and 14th. There were general rains which totaled from 1 to 3 inches except in the northcentral and northwestern counties. Wheat was looking fine in the eastern third and was turning green and showing general improvement in the southcentral and southwestern portions, but in the northcentral and northwestern counties the crop showed very little change. Some progress was made with oats sowing in the southeastern part where this work was mostly finished and a few early fields were coming up.

Third week. Kansas was again well supplied with moisture by heavy wet snows and by heavy rains totaling from 1 to 2 inches in the northcentral and northeastern counties. These were the last sections of the State where the prolonged drought was broken. All sections were abundantly supplied with moisture. Wheat was showing some improvement over most of the State, but in some of the western counties its vitality may not be sufficient to make a good crop. Very little farm work could be done due to wet fields.

Fourth week. Temperatures were mild and there was an abundance of moisture in the soil. These were ideal conditions for the wheat crop, but in the eastern third farm work was suspended because of heavy rains. Disastrous floods occurred in the Neosho River basin. At Burlington, Kans., the rain gage was washed away by the flood, but the precipitation in one 12-hour period was estimated at 12.4 inches. In the central and western third the fall of moisture was light. Wheat was looking fine in the eastern half of the State except in the northcentral counties. In many sections of the State, however, the crop is just coming up and it is uncertain to what extent it will stool and head. In the Dodge City district the wheat plants are having difficulty in getting through the ground which has a hard crust on top. Oats are nearly all sown in the southeastern counties and are coming up with good stands. Elsewhere this work has been delayed and less than 50 per cent of the crop is in the ground. Barley

seeding has begun in the western counties. Potato planting in the Kaw Valley has been seriously delayed by the rains.

At Manhattan measurable precipitation fell on 11 days and totaled 3.9 inches. Maximum temperature was 75° on the 22nd and 23rd; minimum, 4° on the 2nd.

Manhattan

Increase fields of Kanota and varietal plats of oats were sown on the Agronomy Farm March 25, and plans were made to plant the oat and barley nursery March 25. Frequent rains since that date have kept the ground entirely too wet to work and it will not be possible to do any nursery seeding until about April 15. This will be about 25 days after the optimum date of seeding for these crops and it is doubtful whether normal yields will be obtained. The spring grain rod-row nursery will include quite a few new varieties, strains, and hybrids of oats and barley. A large number of head rows of Kanota will be grown and a smaller number of head rows of "off-type" variations found in this variety, some of which would probably be classed as "false wild" oats. A rather large number of single rod rows of Burt oats will be grown which have been inoculated with smut for the last three years and have remained smut free. There has been little or no winterkilling in the winter-wheat nursery and warm temperatures and abundant rainfall have given this crop an early vigorous start. Wheat hybrids in the greenhouse have not done so well as in previous years, probably because of late seeding and temperatures warmer than optimum.

Prof. Salmon attended a meeting in Chicago March 17, at which preliminary plans were made for the International Hay and Grain Show to be held there December 2 to 9, 1923.

Prof. Call spent four days last week in Republic, Jewell, Cloud, Mitchell, Osborne, Rooks, and Ellis counties, studying the present condition of the wheat crop. He found a large number of fields where the seed planted in dry ground last fall had not germinated until spring and very little growth had been made. There are many fields which probably will not produce normal crops. Prof. Call's recommendation to farmers in that territory is to plant at least a part of this questionable wheat acreage to barley, sorghums, or corn, and to leave the best fields of wheat on the chance of having weather conditions which will permit at least a fair crop to be harvested. The report of April 1 of the Bureau of Crop Estimates, on the condition of wheat in Kansas, places it at 65 per cent, or 23 per cent lower than the condition on the same date a year ago, and 16 per cent lower than the ten-year average.

The Fourth Annual Grain Judging Contest put on by the members of the Alpha and Kernel Klub will be held April 8. More prize money has been contributed than ever before and it is expected that the number of entries will be larger than in any previous year. This contest arouses a great deal of interest among the students and faculty of the agricultural division and results in more thorough work on the part of students specializing in agronomy and on the part of all students taking the required courses in farm crops. Mr. E. E. Bayles, assistant in crop improvement, has charge of the preparation of the samples to be used in the contest.

The members of the State Board of Agriculture held one of their regular quarterly meetings at Manhattan April 4 and 5. These men spent about three hours in the agronomy and entomology greenhouses, where they were made familiar with some of the work in wheat breeding, with special reference to the

characteristics of spring and winter wheats and to inheritance of growth habit. They also inspected Prof. Sewell's crop sequence work, especially the effect of sorghum and corn on following wheat crops, and the work being done by Professors McColloch and Salmon on varieties of wheat showing resistance to Hessian fly.

Mr. C. O. Johnston has furnished the following statement concerning plans for the corn-disease work for the 1922 season:

The work will be handled in essentially the same manner as in 1921: that is, the Office of Cereal Investigations and the Departments of Agronomy and Botany of the Kansas station will cooperate in caring for the projects and gathering the data. The work will be divided into three main phases: (1) the root rot project at the central station, where most of the breeding work and detailed work on the causal factors will be done; (2) three cooperative projects located in different parts of the State, where different varieties of corn will be grown; and (3) practical application studies to be carried on at the agronomy farm at Manhattan. The agronomic and breeding phases of the project at Manhattan will be cared for by Carl W. Bower, under the direct supervision of S. C. Salmon, and John H. Parker of the Agronomy Department. The pathologic phases of this project will be under the immediate direction of C. O. Johnston and will be supervised by Prof. L. E. Melchers of the Department of Botany.

The three cooperative projects will be under the direct supervision of H. H. Laude, agronomist in charge of cooperative experiments with farmers. One project will be located at Columbus, Cherokee County, in southern Kansas, where Midland Yellow Dent will be studied. Another project will be located at Marysville, Marshall County, in northern Kansas, where Boone County White will be studied. At Marysville, Mr. Laude will have the active cooperation of C. G. Randell, instructor in vocational agriculture, a graduate of Purdue University and a former student of Dr. G. N. Hoffer. The third cooperative project will be located at the Colby substation, Thomas County, in extreme northwestern Kansas. At this place, Colby Bloody Butcher corn will be used. In all of the cooperative projects, the principal object is to show the correlation between results on the germinator and field behavior and the prevalence of disease in the important varieties of corn commonly grown in Kansas, as well as to study the effect of different soil conditions in relation to disease.

The practical application studies at the Agronomy farm at Manhattan will consist principally of studies of the relation of germinator behavior to field stand and yield. For this work, open-pollinated Pride of Saline (white dent) and Midland Yellow Dent from the 1921 experiments will be used.

At the present time, over 1,200 ears of corn have been tested on the germinators, about 500 of which were placed on the germinators and 1,000 on the modified rag-dolls. Of this total number of ears, about 350 were self-pollinated, the rest open pollinated.

Hays Branch Station, Hays (A. F. Swanson). (April 1) Since the first of April we have had good growing weather. The rainfall has been light in the vicinity of Hays, while in the eastern part of the State there has been an excess of moisture.

Spring crops are making good growth. While the winter wheat has improved a great deal during the last 15 days, the prospects are not good. Weeds will be a serious factor because of the thin stand of wheat.

All the plats have been trimmed on the Cereal Project and further work done on the ground which will be seeded to sorghum.

The Cattlemen's Round-Up will be held at the Station April 29. A good program has been arranged and the results of a number of interesting feeding experiments will be made public. A large attendance is expected.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). (April 15) The weather for the first half of April was generally warm and pleasant. On April 10, a rather severe wind storm occurred. A small amount of snow fell but because of the high wind practically none of it remained on the fields except in an occasional drift. The storm was very peculiar in that it extended over a large area and that so little snow fell that the snow drifts were covered with a layer of dirt. The snow was so wet as to stick to the sides of the buildings. When the snow melted it left the buildings painted with a thin layer of mud.

Because of the favorable weather conditions, spring work has progressed favorably during the past two weeks. The plats sown to spring wheat and barley during the latter part of March are showing up well, in spite of the dryness of the soil. The oats are only beginning to emerge. The warm weather has been helpful to the winter wheat. The winter wheat plats of Cereal Investigations will probably contain only fair stands of plants this season due to soil blowing and to severe winter weather when no snow covered the ground.

During the past two weeks the spring-grain nursery has been sown. The spring nursery contains about 1000 rod rows and several hundred selection rows. Seeding in the spring shelter has not as yet been started. The combined winter and spring grain nurseries and the seedings in the screen shelter probably will total some 3,500 rows this season. A total of probably 650 to 700 field plats, ear-rows and head-rows, will probably be grown. This will bring our experimental seedings of this season up to 4,100 to 4,200, in addition to the work of Dry-Land Agriculture and the cooperatively conducted forage experiments.

WYOMING

Cheyenne Experiment Farm, Cheyenne (A. L. Nelson). No report.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel). (April 15) A conference on flax development was held at the Administration building, Agricultural College, Saturday, April 8. Representatives of the National Paint and Varnish Manufacturers' Associations of the United States, representatives from flax crushers and from the experiment stations of North Dakota, South Dakota, and Montana were present at the conference. Messrs. J. C. Brinsmade and W. E. Brentzel of the Cereal Investigations' Office also were present. The purpose of the meeting was to discuss the prospects for a flax crop in these States and to get out information to the farmers regarding world prospects of the flax crop this year.

Mr. J. C. Brinsmade of the Mandan station, stopped off at Fargo for a day last week while on his return trip from Urbana, Ill. While here he attended the flax development conference and also went over plans for future work on certain cooperative experiments that are being carried out at Mandan.

We are having considerable rain, and the indications are that we will have a late season this year.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). (April 17) The first half of April has been very favorable for field operations.

The snow which covered the ground up to March 1, in some places to a considerable depth, thawed completely during March. The frost was practically all out of the ground early in April.

Land is all prepared for the sowing of spring wheat, which will commence tomorrow.

The first seeding of flax in the date-of-seeding-and-tillage experiment was made Saturday, April 15.

Winter wheat sown last fall has completely winterkilled, with the possible exception of a few plants which are still green. Rye, sown at the same time as the winter wheat, has survived in every row in which it was sown.

Total precipitation for the month of March was 0.52 of an inch. Maximum temperature for March was 55° on March 22; minimum, -10° on March 1. The temperature also dropped to -9° on March 27.

Precipitation for the first half of April was 0.55 of an inch. Maximum temperature, 69° on April 4 and 8; minimum, 26° on April 9 and 10.

Dickinson Substation, Dickinson (Ralph W. Smith). (April 15) The spring season has been rather backward this month, with much damp, cloudy weather that has delayed the drying of the fields. Field work became general the latter part of this week and some seeding has been done.

Some increase plats of wheat have been sown at the substation. Land for the cereal varieties and rotation experiments is being prepared and seeding of these experiments will begin the first of next week.

inter rye at the substation and on farms in the vicinity came through the winter in excellent condition. Winter wheat varieties in standing cornstalks look unusually well, but the large winter wheat nursery is badly winterkilled.

The precipitation for the first half of this month was 0.60 of an inch, part of which fell in the form of snow and sleet.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). (April 12) Although all of the snow has melted, real spring weather has not arrived. A light snow fell April 8 and 9 but it all melted the next day. If we have no more snow or rain we hope to start field work next week. Spring grain should be

sown here during April to obtain the best results. But spring weather has been so backward to date that we fear that seeding will be delayed until May.

Winter wheat has been going through a critical period and does not look quite so thrifty as it did two weeks ago. The soil is saturated with moisture and the surface soil freezes during the night and thaws during the day. The prospects of a good stand are still favorable, however. Wheat sown with the furrow drill appears more thrifty and vigorous than that sown with the ordinary drill, but there are still good stands under both methods of seeding. Practically all of the winter-wheat nursery has come through in excellent condition. The straw on the furrow drill strawmulching experiment has again blown away so badly that the different rates of straw application mean nothing.

I returned April 9 from Bozeman, Mont., where I conferred with Director F. B. Linfield and Prof. Clyde McKee concerning data for a publication on wheat. This publication will probably not be completed until fall or winter on account of the heavy field work during the summer season.

WESTERN BASIN AND COAST AREAS
(North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds). No report.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). No report.

CALIFORNIA

Rice Field Station, Biggs (J. T. Jones). No report.

Agricultural Experiment Station, Davis (V. H. Florell). (April 7) The season is much later than usual here this year and is very little if any advanced beyond that of the Middle West. The prospect for a crop of wheat and barley is very good.

Agricultural Experiment Station, Berkeley (W. T. Mackie). No report.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
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Vol. 14 April 29, 1922 No. 8
Personnel (April 21-29) and Project Issue

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PERSONNEL ITEMS

Dr. Harry V. Harlan writes, under date of April 23, from Sacaton, Ariz., where he is studying progenies of hybrid barleys at the Cooperative Testing Station: "This is a great place to work. Plenty of laboratory space. Good growing conditions. The barley plats are fine."

Willard L. Hart was appointed field assistant on April 25 to work under the direction of Dr. C. H. Tisdale in the cereal disease experiments at Arlington Farm, Va. He fills the position left vacant by the recent death of Bernard B. Brodsky, noted in a recent number of the Courier.

Miss Cecile A. Ream, clerk in the Office since April 16, 1921, resigned her position on April 19 to accept a position as stenographer and typist in the Division of Accounts of the Bureau of Internal Revenue, Department of the Treasury.

VISITORS

Prof. L. E. Call, head of the department of agronomy in the Kansas Agricultural College and Experiment Station, who was in attendance at a meeting of the division of biology and agriculture of the National Research Council, visited the Office on April 22 and 24 to discuss cooperative investigations and other agronomic subjects.

E. C. Filler, of the Boston Office of Blister-Rust Control, was a visitor at this Office on April 26 and 29 to discuss methods and scope of field work in barberry eradication.

Jean Lekeu, a Belgian student who is taking an advanced course in genetics under Dr. E. M. East of the Bussey Institution of Harvard University, was an Office visitor from April 26 to 28 to discuss the subject of cereal production in the United States and to arrange an itinerary for a trip over this country, during the months of July, August and September, that will enable him to see the major producing areas for most of the farm, fruit, and truck crops.

Dr. R. W. Thatcher, director of the New York State Agricultural Experiment Station at Geneva, who was in Washington in attendance at a meeting of the division of biology and agriculture of the National Research Council, was an Office visitor on April 22 to discuss various agronomic matters.

MANUSCRIPTS AND PUBLICATIONS

Engravors proofs of the illustrations intended for Department Bulletin 1074 entitled "Classification of American Wheat Varieties," by C. R. Ball, J. Allen Clark, and John H. Martin, were received on April 27. These include 58 half tone plates and 76 line drawings and maps.

April 24, 1922

SECRETARY'S MEMORANDUM NO. 381

Amendment to the Fiscal Regulations

Paragraph 32(h) of the Fiscal Regulations of the Department is hereby amended to read as follows:

32. ACTUAL TRAVELING EXPENSES

(h) Customary charges for subsistence, except as provided in paragraph 32(r), not to exceed in the aggregate $5 for any one day. These charges will include all expenses incurred for meals, lodging, bath, personal use of room at hotel during the daytime, waiter fees not exceeding 30 cents in any one day; laundry, cleaning and pressing of clothing, not exceeding an aggregate of 40 cents per day, to be pro-rated and distributed against the daily subsistence allowance for each preceding day of the period covered by the laundry bill; telegrams to hotels reserving accommodations, to be included in subsistence expenses for the initial date of the period for which the accommodations are occupied; street-car and other fares between place of lodging or where meals are taken and place of duty, and all other subsistence expenses. A charge for lodging at a hotel and a charge for sleeping berth for the same night will be allowed only when accompanied by a definite statement of necessity. Receipts for laundry and for cleaning and pressing of clothing must be submitted or a statement filed with reimbursement account showing that to obtain them was impracticable. The period covered by the laundry charge in each case must appear in the account. Charges for laundry at official headquarters at the termination of a trip will not be allowed: Provided, That because of State laws reimbursement for the payment of waiter fees will not be allowed in Arkansas, Georgia, Mississippi, South Carolina, or Tennessee.

Henry C. Wallace

Secretary.

PROJECT REPORTS

211 A 2 WESTERN WHEAT INVESTIGATIONS

J. ALLEN CLARK, Agronomist in Charge, and JOHN H. MARTIN, Agronomist

Winter-Hardiness Investigations

Winter hardiness investigations including tillage methods, crop cover, adaptation of varieties and breeding are in progress.

Statistics collected by the Bureau of Crop Estimates during the past 18 years show that from 1.1 per cent to 31 per cent of the acreage of winter wheat sown annually is abandoned. The average is 9.7 per cent. The heaviest losses occurred in 1917. Additional estimates during the 11 years from 1909 to 1919 indicate that the yearly losses of all wheat due to climatic factors, disease, pests, and defective seed, have averaged 28.8 per cent of the crop. Of this, 4.5 per cent was due to frost or freezing compared with 2.7 per cent due to plant diseases. Frost or freezing comprises the second largest cause of wheat losses, being exceeded only by that from deficient moisture.

Furrow Drill and Straw-Mulch Experiments

The furrow drill designed by Prof. S. C. Salmon, in charge of farm crop production, Kansas Experiment Station, Manhattan, Kans. is being used in comparison with the ordinary drill for sowing winter wheat. The furrow drill is an ordinary Van Brunt disk drill with special attachments. The furrow openers are placed twelve inches apart and consist of two disks arranged tandem so that the seed is sown in the bottom of a furrow four to six inches deep. These furrows hold snow which offers some protection to the wheat plants and they also hinder soil blowing.

The experiments include different rates of seeding, ranging from 2 to 5 pecks per acre, and also direction of seeding, the drill rows being run both north and south and east and west, and are duplicated with the ordinary disk drill. This experiment has been in progress for several years at Fort Hays Experiment Station, Hays, Kans., and has been conducted for 3 seasons at the Fergus Co. Substation at Moccasin, Mont. Similar experiments are conducted at Manhattan, Kans. In Kansas, recent winters have not been severe and the use of the furrow drill has shown but little advantage except when soil blowing was a factor. It has been found, however, that no decrease or loss in production is caused in favorable seasons by the use of the furrow drill. At Moccasin, Mont., during the past two seasons, winter wheat sown with the ordinary drill yielded at the rate of 12.5 bushels per acre, whereas that sown with the furrow drill yielded 20.1 bushels per acre. Straw mulch as a cover for winter wheat has not given outstanding differences in yield, the chief difficulty being that much of the straw is blown from the land on which it is applied. Some increases in yields have been obtained by moderate applications of one-half ton to two tons of straw per acre on land sown with the ordinary drill.

Uniform Winter Hardiness Experiments

During the past three seasons, uniform nurseries of about 20 of the hardiest winter wheats have been grown at 17 experiment stations in the northern United States and Canada. Varieties are included in these nurseries which previously have shown indications of being winter-hardy at the various experiment stations. Observations to date indicate that the varieties which have the greatest winter hardiness are Minhardi, Buffum No. 17, Odessa, and Minturki.

Breeding Experiments

The hardiest varieties have not proved satisfactory in the northern semi-arid sections from the standpoints of yield and milling and baking. Minturki appears to be quite satisfactory, however, in Minnesota. In order to obtain a wheat which is as hardy or hardier than the hardiest of our present varieties, and also one of good yield and milling and baking quality, many hybrids have been made between the hardy wheats and such varieties as Kanred, Turkey, and Kharkof.

The creation of resistant strains is being attempted by two methods: (1) By making many different combinations and testing the F_2, and later progenies for winter-resistance at various northern field stations, either as individual selections or as bulk sowings; and (2) by making many progeny strains of the most desirable combination or combinations, studying the inheritance and purifying the strains at breeding stations.

About 45 combinations of hardy winter wheats have been made during the past 4 years. Most of these were made at Manhattan, Kans., Chico, Calif., and St. Paul, Minn. The nurseries sown at the northern stations in the fall of 1921 include nearly 1300 rows at Moccasin, Mont.; about 1550 at Dickinson, N. Dak.; 660 at Mandan, N. Dak.; and about 700 at Fargo, N. Dak. Preliminary observations made this spring indicate almost complete winter-killing of the strains sown at Mandan, a heavy killing at Dickinson, and only partial or slight killing at Fargo and Moccasin. Three of the combinations and their reciprocals, viz: Kanred x Minhardi, Kanred x Minturki, and Buffum No. 17 x Eureka, are being studied in detail at these stations, in order to obtain all possible information in regard to the factors concerned in the inheritance of winter hardiness. The remaining crosses are being grown in bulk or in rows representing F_1 families, to permit the survival of the hardiest strains.

Further intensive breeding investigations are under way on this problem in cooperation with the Kansas and Minnesota Experiment Stations. A large series of F_3 hybrids of Kanred x Minturki is being grown at the Kansas station, while at the Minnesota station an extensive F_4 series of Minhard x Minturki is being studied.

FLAX INVESTIGATIONS

Arthur C. Dillman, Agronomist in Charge

Experiments with seed flax at the San Antonio, Texas, Experiment Farm in 1922 consist of a varietal comparison of 5 varieties sown in duplicate 20th acre plats, and 12 varieties sown in duplicate 16-rod rows. The seeding was done on November 28, 1921, after a shower of 0.31 of an inch, but a poor stand was secured because of a heavy beating rain on November 30, which buried the seed too deep and formed a hard crust on the surface soil.

A letter of April 7, 1922, from Mr. Geo. T. Ratliffe, Farm Superintendent, says:

"Flax in the variety test was replanted on February 1. The land used for the original planting was gone over with a spike-tooth harrow and the varieties replanted on the identical original plats. Germination was quite satisfactory, but when the plants were from 1 to 2 inches high we had about 4 days of below freezing weather; the minimum being 21°F. and from 10 to 100 per cent of the small seedlings were killed.

In spite of our having harrowed the original plants quite vigorously, they practically all resumed growth, and those plants are now showing more promise of producing seed than the small percentage of new plants. The stands of these older plants run from 5 to 50 per cent of a full stand. The present stands of flax in the nursery row planting run from 0 to 100 per cent of a perfect stand.

Immediately following the above referred to freeze we had several days of extremely high winds which whipped and damaged the flax severely. The earliest variety began blooming March 25. No precipitation of consequence occurred from November 30 until the last of March, and due to the very dry condition of the seed bed during this period no plantings were made in our contemplated "time-of-planting" test. All our fall plantings suffered severely from drought and until March 25 it looked as though they surely would prove complete failures. Since that date, however, we have more than 6 inches of rain and their recovery has been quite remarkable."

C E R E A L C O U R I E R

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Personnel (May 1-10) and Field Station (April 16-30) Issue.

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PERSONNEL ITEMS

Charles F. Chambliss, agronomist in charge of Rice Investigations, returned on May 1 from a trip to the rice-producing sections of the South. Two weeks or more were spent at the Rice Experiment Station, Crowley, La., in the preparation of materials for the experiments this season.

Jesse G. Fisher resigned his position as teamster at the Aberdeen Substation, Aberdeen, Idaho, on May 5. Because of ill health he was obliged to go to California.

J. M. Hamerly writes from Florence, S. C., under date of May 8, that full germination counts have been made of all except one-fifth of the corn rows planted at the Pee Dee Substation and that there are very few missing hills in the rows counted. The remainder, however, are under water and it is impossible to state whether or not there will be any stand at all in these rows.

Merill B. Kroft, who was appointed field assistant, effective April 16, to assist in barberry eradication in Indiana, died on or about May 1, after an illness of two weeks, without having reported for duty under his appointment.

William A. Kurtz was appointed field assistant, effective May 1, to assist in barberry eradication in Colorado, Illinois, Iowa, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming, with headquarters at Brookings, South Dakota.

Arthur E. McClymonds, who has been in charge of the cereal experiments at the Aberdeen Substation, Aberdeen, Idaho, resigned his position on May 1 to become superintendent of the Station on the payrolls of the Idaho agricultural Experiment Station. His services have been retained by this Office as a collaborator under an appointment effective May 1.

John W. Reddy was appointed unskilled laborer, effective May 1, to work under the direction of Charles S. Reddy in the cooperative investigations of corn diseases at Bloomington, Ill.

Frederick D. Richey, in charge of Breeding and Cultural Investigations of Corn, left Washington on April 30 for Knoxville, Tenn., to complete the plans and preparation of material for the cooperative investigations of corn established this year at the Tennessee Agricultural Experiment Station. He returned to Washington on May 5.

Miss Amelia Shropshire was married on April 27 and her name now appears on the payrolls as Mrs. Amelia S. Guernsey.

Dr. E. C. Stakman arrived in Washington from St. Paul, Minn., on May 8. He is in conference with officials of the Office of Cereal Investigations and with others regarding plans for the rust epidemiology studies during the coming season. He is also making final preparations for an extensive investigation of the distribution of common barberries and of black stem rust in various countries in Europe, where he will study intensively the relation of the barberry to the production of rust under various sets of climatic conditions and also determine the exact effect which the eradication of barberries has had upon the occurrence of rust in various areas under different sets of conditions where eradication has been accomplished. Dr. Stakman will sail for Cherbourg, France, on May 15, and will spend about four months in this investigation, which will cover the major portion of Europe from the Mediterranean Sea to the Arctic ocean and will include most of the following countries: Greece, Bulgaria, Rourania, Serbia, Jugo-Slavia, Czecho-Slovakia, Italy, Switzerland, Austria, Hungary, Poland, Latvia, Esthonia, Lithuania, Germany, Denmark, Sweden, Norway, Great Britain, Holland, Belgium, France, Spain, and Portugal. Dr. Stakman also will investigate the question of the occurrence of different strains or biologic forms of black stem rust in Europe, and the progress that has been made in developing varieties or strains of wheat resistant to such strains of rust.

William B. Walker was given an appointment as field assistant, effective May 1, to assist Victor F. Tapke in the investigation of smuts of wheat and barley on the experiment plats at Arlington Farm.

VISITORS

Mrs. J. B. Cooley, a representative of the Grand Forks (N.Dak.) Herald, was an Office visitor on May 6. She was interested in ascertaining what has been accomplished in the eradication of barberries in the wheat-growing districts of the central Northwest and in the breeding and selection of wheat varieties resistant to rust, particularly the Kota, which is grown commercially in North Dakota.

Dr. F. D. Kern, head of the department of botany, Pennsylvania State College, visited the office on May 6 to participate in a conference relative to cooperative rust investigations.

MANUSCRIPTS AND PUBLICATIONS

The 72 illustrations for the Wheat Section of the 1921 Yearbook were completed and transmitted on May 8. These include 9 half-tones and 63 line drawings, of which 31 were maps and 32 were graphs.

A Joint Resolution providing for the re-establishment of various Government periodicals as of date December 21, 1921, has passed both Houses of Congress. It is expected that the seven manuscripts previously submitted for publication in the Journal of Agricultural Research and more recently resubmitted for publication in the Department Bulletin series, as noted in the Courier issues of March 31 and April 10, now will be scheduled again for publication in the Journal of Agricultural Research.

A paper entitled "The Relation of Temperature and Hydrogen-Ion Concentration to Urediniospore Germination of Biologic Forms of Stem Rust of Wheat," by C. R. Hursh, agent, Office of Cereal Investigations, and assistant in plant pathology, Minnesota Agricultural Experiment Station, University Farm, St. Paul, was approved on May 2 for publication, without compensation, in Phytopathology.

During the latter part of April, D. E. Stephens read galley proof of the proposed Oregon Station Bulletin on "Wheat growing after fallow in eastern Oregon," covering cooperative investigations at the Sherman County Branch Station, Moro, Oregon.

On May 6 galley proof was read or Department Bulletin 1074, entitled "Classification of American Wheat Varieties," by J. Allen Clark, agronomist in charge, John H. Martin, agronomist, Western Wheat Investigations, and Carleton R. Ball, Cerealist in Charge of the Office of Cereal Investigations.

A short paper entitled "The Use of the Greenhouse in Corn Breeding," by Frederick D. Richey, noted in the Courier of February 28, was published on April 15, 1922, in the Journal of Heredity for November, 1921.

Department Bulletin 1039, entitled "Experiments with Cereals on the Belle Fourche Experiment Farm," by John H. Martin was received from the government Printing Office May 11.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). (April 20) Early varieties of oats are fully headed and making an excellent growth. Fulghum oats seeded Oct. 15 in the date-of-seeding experiments are fully five feet tall. Red Rust proof oats are just beginning to head and also are making an excellent growth.

The early varieties of wheat are fully headed and have made a very good growth. Rust is very severe, apparently due to the mild winter, and the indications are that considerable damage will result.

Considerable areas were sown to oats and wheat in this section last fall. Where seeded early the growth is good, but late seeding will result in a low yield in many cases.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). (May 1). The weather during the month of April has been cold and generally rather wet, with the result that it was impossible to do any seeding until the last week of the month. During the last week the seeding of the barley and oat hybrids was made in the garden and on the 28th and 29th the rod rows of barley were sown on the farm. If fair weather continues for three or four more days the rod rows of oats will all be sown. During this cold weather wheat has made very little advance.

From the 27th to the 29th, five series of rod rows of oats and also one plat of barley were sown in five different counties.

The work on the new threshing and seed storage building for the department is moving forward and it is hoped that the building will be completed in time for the storage of the coming harvest.

The varieties that were sown in the greenhouse for further crossings are now heading out and some crossing has already been done and others are ready to work.

The hybrids were Kubanka and been crossed with both the common wild and the synthetic wild forms are now heading, and so far the indication is that both the common wild and the synthetic wild types behave the same in inheritance when crossed with the same variety.

VIRGINIA

Arlington Farm, Rosslyn. Cereal Project: (J. W. Taylor) No report.

Corn Project: Mr. Hartley made an early planting of some 30 varieties about April 28.

Oat Project: (May 10) Mr. Stanton reports that from present indications an excellent crop of winter oats will be harvested again on the Arlington Farm. The winter survival in practically all varieties has been 100 per cent. While the past winter in general was considerably colder than that of 1920-21, the more tender varieties of winter oats suffered but little winterkilling. The cold and rather backward spring has been very favorable, but the maturity of the crop will be later than usual.

It was hoped that the winter would be severe, in order that the numerous selections which are being grown in the F_3 from crosses between Fulghum and Culberson, Fulghum and Hutcheson, and Fulghum and other hardy oats, would be subjected to a severe condition and their winter hardiness determined. As a consequence of the mild winter it will be necessary to grow the greater number of these again next year, especially the earlier ones, to determine their cold-resistant qualities. Fully two-thirds of these strains are now heading, thus showing the characteristic earliness of the Fulghum parent.

The Aurora, "Ferguson Navarro", and Fulghum varieties in field plats are heading. Fulghum (C. I. No. 708) and Kanota (C. I. No. 859), are being grown for the first time in adjoining plats in the triplicate fortieth-acre varietal series, and to date it has not been possible to note any difference whatever between the two. Some of the so-called false wild oats, are appearing again in the Fulghum strains. A special effort will be made to determine just how prevalent these forms are in some of the other varieties, especially in Aurora and Culberson, as a few have been found in these varieties in previous years. It is believed that these semi-wild forms are more common in oats than is generally thought to be thecase.

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hammerly) No report.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (April 18). This spring has been the wettest on record in Missouri. Over 17 inches of rainfall has been recorded since March 1, and there has been practically no opportunity for farm work up to the present time. Only a very small acreage of oats has been sown thus far in the State, and probably not much more will be sown. On the Station field we have been unable as yet to make any spring sowing except a few hundred rows of the earliest seeding in a date-of-seeding test with oats. These oats were sown February 22 and since that date it has been impossible to make further seedings.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (May 3). Rain last week interfered with the preparation of the field for our experimental corn. The weather cleared sufficiently, however, to enable us to fit it up Monday and Tuesday of this week and finish marking out yesterday.

We began planting on the 2d between intermittent showers. Steady rain all last night has held up further planting until the weather clears again. It is not likely that we can resume planting before the 6th.

Mr. Richey arrived Monday afternoon, May 1, and will leave in the afternoon of May 4 for Washington D. C.

IOWA

Iowa State College, Ames (Barberry Eradication, R. H. Porter). No report.

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

ILLINOIS

Funk Brothers Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert). No report.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) No report.

INDIANA

Purdue University Agricultural Experiment Station (Corn Root, Stalk, and Ear Rots, G. N. Hoffer). No report.

Purdue University Agricultural Experiment Station (Leaf Rust Investigations, H. S. Jackson and E. E. Mains). No report.

Purdue University College of Agriculture (Barberry Eradication, H. S. Jackson, Col.) (May 5). Because of the sudden illness and death of Merrill B. Kroft, the only field assistant under appointment, no resurvey has been made. R. J. Hosmer, former State Leader, resigned his position late in April and Keller E. Beeson will be the new State Leader beginning June 1. In the meantime, the activities are under the general direction of Dr. H. S. Jackson head of the department of botany. New men are being appointed to begin field work in May, June and July.

OHIO

College of Agriculture of Ohio State University, Columbus (Barberry Eradication, John W. Baringer). No report.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (April 30). Preparations are made for a resurvey to begin in Monroe County the first of May. O. K. White, a deputy inspector of the State Department of Nurseries and Orchards, will be available. The State department of agriculture is also furnishing an automobile. We hope that the resurvey will be completed in the territory covered in the original farm-to-farm survey shortly before the first of July. This will make it possible to put the entire new work of the season on the original farm-to-farm survey problem.

With the assistance of the State Farm Bureau a publicity campaign is being carried on in practically every county. Barberry Eradication is live subject matter with every County Agent.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) No report.

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson) (April resume) Wet weather during most of April effectually prevented much field activity, but a little scouting was done during the latter part of the month and arrangements were made to have one crew start work on May first. This crew will resurvey three counties in the southeast corner of the State. As there are no known barberries in these three counties and as the resurvey will be completed before any possibility of spread of rust from such sprouts as are found, we hope to secure data from that area as to the effectiveness of our campaign over a limited area.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) No report.

College of Agriculture, University Farm, St. Paul (Barberry Eradication, Leonard W. Melander) (April resume). During the month of April, preparations for the summer activities were in full progress. Over 60 applicants were interviewed with a view of getting the best men possible for field work this year. Applications were received, not only for appointments with the Federal Department, but for work in the State campaign as well.

Circular letters were sent out to owners of properties where common barberry had been removed in 1920 and 1921. These letters caution and advise people to check the former locations of bushes for sprouts and seedlings.

Impassable country roads prevented systematic farm-to-farm survey. However, 65 bushes were found on six properties during the month. Twenty-two sprouts were found in the resurvey of two properties. Good weather in the last few days has brightened the prospects for starting the farm-to-farm survey the first part of May.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). (May 1). The spring has been rather cool to date and the ground has not warmed to any extent. The seed sown April 15 in the date-of-seeding experiment is not yet fully emerged although the chances are good for fair stands in these plats. It was too wet to seed the second plats to-day and the indications are that the May first dates will be further delayed as the rainy spell is not over yet

Threshing sorghum seed heads is progressing fairly well in spite of the fact that no electricity can be procured from town. This necessitates winnowing the seed by wind instead of an electric fan.

Maximum temperature for last half of April, 83° F. on the 22nd; minimum was 32°, April 18. The precipitation for the last half of April was 1.54 inches, in the form of 7 showers occurring since the 22nd.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker). (May 1). Prof. L. E. Call, of the Agronomy Department, attended a meeting of the National Research Council in Washington, D. C. on April 23. He is spending the first two weeks of May on the "Row, Sow, and Hoe Special," being run over the lines of the Santa Fe railroad in cooperation with the Extension Division of the Agricultural College. Members of the Dairy, Animal Husbandry, and Poultry departments are emphasizing the need of more livestock in Kansas and Prof. Call is giving talks on soils and crops subjects with special reference to the production of forage and feed crops for live stock.

Oats and barley were seeded in the nursery on April 13 to 15 and came up to good stands by April 24.

A new Folkner Light Draft harrow has been purchased for use in bindweed eradication in the nursery.

Carl Bower, field assistant in corn disease investigations, placed second in the Kloa and Kernel Klub grain judging contest held on April 8. Mr. Bower is classified as a sophomore but has had considerable experience in crops work in the agronomy department in addition to his college training.

About 100 head rows of Feterita X Red Amber sorghum hybrids will be grown at the agronomy farm this year. About the same number of head rows of Dwarf yellow milo X Kansas Orange sorghum will also be grown. Both of these seed lots will be inoculated with kernel smut in order to study the inheritance of smut resistance in these crosses. A number of head rows will be continued in order to study the phenomenon of heterosis as it exists in sorghum.

Accession books have recently been secured to take care of the records, origin, and history of varieties of corn, sorghums, and leguminous crops. A very complete set of accession records for the small grains has been kept for more than ten years.

The members of the Southwestern Millers League have subscribed about $25,000 for a campaign of wheat improvement. This money will be used for publicity in the hard winter wheat belt of Kansas, Oklahoma, the Panhandle of Texas, eastern Colorado, and northern Missouri. An effort will be made to interest wheat growers in the production of a better quality of wheat by means of proper methods of seed-bed preparation, the use of a good quality of seed of the best adapted varieties of hard winter wheat, and of more careful handling of the crop from harvest to the time it is marketed. Only about one-ninth of the hard wheat reaching Kansas City grades No. 1. It is believed that more attention to methods of wheat production and handling will result in a higher proportion of the better grades of wheat. There is often a difference of from 10 to 40 cents a bushel in the Kansas City prices for different quality wheat even within the same numerical grade.

The State Board of Agriculture Crop Report, issued on April 15, gave the conditions of the remaining wheat acreage in Kansas as 73.9 per cent, which is the second lowest ever reported at this season. It is estimated that 11,300,000 acres of wheat were sown in Kansas last fall, the third largest acreage in the history of the State. It is estimated that about 26 per cent of this acreage has been abandoned, leaving only about 8,300,00 acres to be harvested. Most of this abandonment was due to drough and dry soil last fall and in the early winter, which prevented germination from taking place in the spring. Much of the spring-germinated wheat has not made sufficient growth to compete with the weeds or to produce a normal crop.

April Weather at Manhattan.

Maximum temperature, 82° on April 6, minimum 29° on April 18, (killing frost). There was a measurable precipitation on 11 days, the total for the month being 5.13 inches. There were only 11 clear days, 10 partly cloudy days, and 9 cloudy days.

Weather and Crop Conditions in Kansas, 1st week in April: Frequent rains and excessive cloudiness in the eastern half of Kansas with temperatures somewhat low for the season over all the State made this a backward week for farm work but fine for wheat and grasses. Frost and freezing weather occurred in many parts but crops were not far enough along to be damaged. The rainfall totaled from 1 to 2 inches over nearly all the eastern third, with close to 1-2 inch in the central portion but generally light in the western counties. Wheat had stooled well and was looking fine in the eastern third but elsewhere only the early sown was in good condition. A large per cent of the late-sown wheat was just coming through the ground in the western counties where its growth has been slow. Several of the southeastern counties report that oats had all been sown and in many other sections from 25 to 50 per cent of the crop was seeded. About half the barley crop had been sown in the western counties.

Second Week: Soaking rains that totaled from 2 to 5 inches fell over the eastern third and south central counties and prevented any progress with farm work. Extensive overflows did considerable damage in the southeastern counties. Heavy snow fell in the extreme southwestern counties on April 10, when temperatures of 16 to 20° were recorded. Wheat was looking fine in the eastern third and was jointing in the southeast and a few south central

counties and stooling satisfactorily elsewhere in the eastern district. Much of the wheat in the western and north central counties has come up so recently that the ground seems almost bare and Russian thistles threaten to choke out the wheat. In the eastern half of the State spring work was two weeks behind the season, owing to excessive rainfall. Oat seeding was delayed to such an extent that the acreage will be considerably reduced. In the western half of the State barley seeding was well toward completion.

Third week: Abnormally cool weather was general this week with freezing temperatures several nights in the western half and temperatures of 28 to 32° in all parts of the State on the 18th. Rainfall in most sections was light, but a heavy snow fell in the northwestern counties on the 17th and heavy rains in the southeastern section. Wheat was reported as being in good to excellent condition in the eastern third and south central counties except in low or poorly-drained localities, where some of it was turning yellow from prolonged wet weather. In the north central and northwestern counties wheat was reported as being in poor condition where it was stooling poorly and weeds threatened to take much of it. Spring work and spring crops were reported as backward in all sections, generally about two weeks late. Stands of oats are poor in many sections, because of unfavorable weather. Barley sowing was more than half completed in the northwestern counties and some early sown fields were up and showing green. Corn planting was begun in Sumner County.

Fourth week: This is a sunshiny week. No moisture fell until the 23rd when there were moderate to heavy rains in all parts of the State, except in some southwestern counties. The weather was favorable for wheat, which was making a vigorous growth in the eastern and south central counties. There were some complaints of yellow spots due to too much wet weather, and the growth is a little too rank on low lands. In the north central and western counties, wheat, especially the late sown, lacks vitality and much if it was just beginning to stool and show up green on the ground. Sowing barley and oats has just about ended owing to the lateness of the season. Corn planting was begun over the east half of the state.

Hays Branch Station, Hays (A. F. Swanson). (May 2). The precipitation for the first four months of the current year has been above normal as the following table will indicate. The first column is the normal rainfall for a 50-year period.

	Normal	1922
January	.56 inches	.00 inches
February	.85 inches	.93 inches
March	.97 inches	1.71 inches
April	2.26 inches	4.95 inches
Total	4.64 inches	7.59 inches

The excess rainfall was readily absorbed by the soil. The spring crops are in excellent condition.

Spring-sprouted winter wheat is now in the first joint and making good growth. Where the stand is good and the ground free of weeds there is a fairly good prospect for a fair crop. Weeds have just begun to show a vigorous growth in a number of fields.

The Station's Annual Round-Up was held April 29. The attendance was not so large as usual because of rainy weather, but a great deal of interest was shown in the feeding results.

COLORADO

Agricultural College, Fort Collins (Barberry Eradication, John R. Fitzsimmons) (May 5). In a resurvey south of Greeley a number of sprouts and two bushes were located in Platteville. The bushes had practically leaved out, but no infections from stem rust were present. Grain fields inspected showed no signs of rust. West of Ft. Lupton and near Erie and Lafayette a few sprouts were removed, some from a nursery where 200 bushes had been removed previously. No rust was found.

Akron Experiment Farm, Akron (F. A. Coffman). (May 1). Climatic conditions of the past two weeks have been exceptionally favorable for the experiments and the prospects are very bright, as a whole, for the season's work. During the past week a total of nearly 3.5 inches of moisture was received. This storm held out from April 24 to April 29. During this entire period it rained almost continuously. As the rain fell very slowly practically no run-off occurred and the maximum amount of moisture was absorbed by the soil.

During the past half-month the seeding of spring grain in the cereal plat and nursery projects was completed. A total of over 4,250 plats and rows of cereal grain has already been sown. With the exception of a few sections in the winter-grain nursery fair stands still remain on all of the different winter-grain projects. The spring grains are emerging to excellent stands in most cases and the spring-grain nursery is now just emerging.

Experimental seedings of small grains has been practically completed in the screen shelter. Nearly twice as much work is being done in the shelter this season as was done in 1921.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). No report.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). (April 29). The experiments with Spring cereals will be greatly reduced and will consist of the nursery and increase fields. The winter wheat field plats will be continued. However, wheat seeded on fallow has a very poor chance of making a crop. At 3 or 4 different times a considerable percentage of the crop emerged but because of soil blowing the young plants were killed. Even the plants which made a fair growth last fall have suffered severely. The emergence on oat stubble is taking place at the present time and a fair crop is expected.

The first precipitation of agricultural importance since July 4, 1921, occurred during the past week. The total of 1.17 inches makes the farmers and ranchers feel very much encouraged concerning this year's crop. A large acreage of wheat is being seeded this year. The Station in cooperation with the County Farm Bureau, and the State Extension Service, has distributed a large quantity of Acme wheat. The Laramie County Farm Bureau is of considerable aid in getting the results of the Experiment Station before the farmers.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (April resume) During April life cycle cards were sent to a number of the inhabitants of Cheyenne, in which place practically all of the barberry now present in the State is located. No survey work was done during the month because of the lateness of the spring and the fact that practically all original survey work was completed last year.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (April resume) The time during April was spent largely in preparing publicity and plans for spring and summer work. A large amount of publicity was done through the mails. At two of the district County Agent conferences 26 county agents were interviewed concerning eradication in their counties. The county agents show much enthusiasm and have offered to help in every possible way. No field work has been possible this month, since the late spring has prevented the early opening of the leaf buds of the barberries and they can not be identified.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). (May 2). The weather of the last half of April, though cool, dry, and windy has been generally favorable for field work.

Wheat and oats were sown in varietal plats April 21 and emerged about April 30. Barley varieties were sown April 27 and are just beginning to emerge.

Flax sown in the date-of-seeding-and-tillage experiment April 15 emerged about April 25.

A few plants of winter wheat in three consecutive rows have survived. All the rest have winterkilled.

The second seeding of the Flax date-of-seeding-and-tillage experiment was made May 1.

Maximum temperature for the last half of April was 89° on April 22; minimum, 15° April 18; precipitation, 0.11 of an inch. Total precipitation for April, only 0.66 of an inch, more than an inch below the 45-year average for April.

State College of Agriculture, Agricultural College (Barberry Eradication. George C. Mayoue) (April resume) Some field work was done during the last week of April in checking several of the properties in the vicinity of Fargo. On account of moisture conditions during the winter and spring, the roads will not permit a farm-to-farm survey for at least a two weeks.

The greater part of this month was spent in publicity, principally with the rural schools, acquainting them with the life cycle of the black stem rust and the campaign against the common barberry. Bulletins, posters, mountings, and life-cycle cards were mailed to these schools. Dean Bolley and the State Leader met with the State Committee of the Farm Bureau and gave them a demonstration and talk. That Committee which represents the Farm Bureau people of the State promised to give us their best support in the campaign against the barberry.

News articles were published in all the larger papers of the State, giving accounts of the progress of barberry eradication in North Dakota and the other 12 states, the results of the State Leaders' Conference in St. Paul, and the future plans.

Since April 1, the State Leader has been conducting a school every Saturday for all men interested in the possibility of employment as field assistant in barberry eradication in North Dakota. The school gives lectures and demonstrations by different members of the College faculty, not only on black stem rust and its relation to the barberry, but other agricultural subjects particularly important in North Dakota. There probably will be three more meetings. Each meeting lasts about two hours, and from 30 to 50 men are in attendance. The heads of departments and the faculty are very much interested in the school.

Dickinson Substation, Dickinson (Ralph W. Smith). (May 1). Varietal plats of wheat were sown April 21 and 22, and oats and barley varieties were sown April 25 and 26. Wheat varieties were sown in triplicate 1/32-acre plats with alleys two feet wide between plats. The oats and barley varieties were sown in quadruplicate 1/56-acre plats with winter wheat or winter rye sown in the alleys between plats. The object was to eliminate the border effect to some extent and remove the necessity of cultivating the alleys.

Seeding operations have been delayed by frequent showers and snowsqualls during the middle of the month and windy weather during the past week has interfered somewhat. The temperature during the latter half of the month was considerable below normal. The total precipitation for the month was 1.11 inches.

Nursery seeding will begin tomorrow if the weather permits. Most of the nursery varieties of wheat, oats, and barley will be sown in triplicated rod rows.

Early-sown wheat is just emerging. Rain is needed, as the surface soil is becoming dry from frequent windy days.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (April 29). Field work was started April 24, but a heavy hail on April 27 and rain on each of the two succeeding days will delay further field activities until the early part of next week. The field plats of oats and barley under the Cereal Project were sown before the rain. The field plats of spring wheat and flax, and an extensive spring nursery remain to be sown. Most farmers were preparing land for spring seeding when the rain came.

Winter wheat sown on fallow is in excellent condition and some farmers report that wheat sown in stubble is in good condition. Most of the wheat under the Cereal Project, including the nursery, came through the winter with practically 100 per cent survival. In the furrow-drill experiments, the wheat sown with the furrow drill shows much more vigor and growth than that sown with the ordinary drill. However, there is a small percentage of winter killing in the ordinary drill seedings of the furrow-drill experiments.

The precipitation recorded for April is about 1.25 inches, of which over an inch fell during the last three days. Hail on April 27 amounted to more than one-half of an inch of precipitation. The temperatures of the past month have been below normal.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). (May 8) Plans are being prepared for a summer resurvey and a study of the spread of rust.

WESTERN BASIN AND COAST AREAS
(North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds). (April 25). The weather has opened up and is giving us some good seeding weather. When it did dry off it did a good job of it and did it in a hurry. A number of the fortieth acre plats of wheat, barley, oats and sugar beets have been seeded. All of the peas have been seeded. The seeding of the oats will be finished tomorrow and the clover and alfalfa before the end of the week. The increase plats of 1/10 acre each will all be seeded this week, in fact everything except the potatoes and the nursery.

Mr. Weibe will be here for fore part of next week and we will have his ground ready and will give him all the assistance that he wishes in planting the nursery.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). (April 18). We are still having unusually cold weather here and winter wheats are making practically no growth. We have just finished sowing our spring grains.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (April 30). The ground was too wet to work until April 14, therefore planting is a little later this spring than it was last year. The land is all in shape for seeding. Some of it has been seeded and is being irrigated at present. We expect to finish this week if the weather will permit.

Practically all the farmers are seeding rice at present and a considerable acreage will be irrigated for the first time this week. The weather, until the past three days, has been too cold to insure good germination if rice had been sown and irrigated at an earlier date.

The maximum temperature for April was 86 degrees on the 25th, minimum 30 degrees on the 18th. The total evaporation was 4.95 inches. Total rainfall 0.42 of an inch. The temperature has been below normal.

Agricultural Experiment Station, Davis (W. H. Florell). (May 2). The cereal experiments are in good condition, with very satisfactory stands in most cases. Plant growth is moderately large and of good color. Barley varieties in the comparative experiments are in various stages of heading. The barley identification nursery is lengthening out rapidly, and first heading notes have been taken on possibly one-third of the rows. Early varieties of wheat have begun heading, but only the Sunset variety is fully headed. Varieties of oats are also heading, while the wild oats are about fully headed. Most of the plants of the Marquis x Sunset cross have been tagged for first heading as well as many of those of the Kota x Hard Federation cross. No wheat rusts have been observed to date.

Commercial grain fields in the vicinity are also in good condition, but crop prospects are best for the earlier sowings. The late-sown fields still look well, but the plant growth is short and more rain is needed. The weather during April was dry with considerable north wind. Reports from the northern part of the Sacramento Valley state that there has been a great deal of north wind during the month and that late-sown grain is short and needs moisture badly.

Agricultural Experiment Station, Berkeley (W. W. Mackie). No report.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 14 May 20, 1922 No. 10
Personnel (May 11-20) and Field Station (May 1-15) Issue.

PERSONNEL ITEMS

Arthur C. Dillman, agronomist in charge of flax investigations, left Washington on May 12 for Mandan, N. Dak., and points en route, for the purpose of continuing his study of flax breeding and of methods of flax production. He will spend the summer months in this investigation and in field study of flax growing from Wisconsin to Montana. Until his return to Washington about the middle of September his temporary headquarters will be at the Northern Great Plains Field Station, Mandan, N. Dak.

Miss Helen L. Getty was given an appointment on May 16 as stenographer and typewriter, on transfer from the War Department.

Dr. H. V. Harlan, agronomist in charge of barley investigations, returned on May 17, from Sacaton, Ariz., where he was studying the progenies of hybrid barleys at the Cooperative Testing Station. Notes were taken on 15,000 barley plants, the progeny of 31 crosses. Dr. Harlan reports a very high percentage of germination of the seed that was planted this year. It was interesting to note the fact that all of the plants headed. Exceptionally favorable growing conditions prevailed at Sacaton this year. Dr. Harlan also reports that the acreage of cereals in the Salt River Valley is greatly increased this year.

William L. Popham has been given an appointment, effective June 12, to assist in barberry eradication in Montana, with headquarters at Bozeman.

Mrs. Mildred B. Sisler was appointed stenographer and typewriter on May 16, on transfer from the War Department.

Dr. E. C. Stakman left Washington on May 12 to sail from New York on the following day for Cherbourg, France, from which point he will start his extensive European tour of investigation in connection with the distribution of barberries and the occurrence of black stem rust. As noted in the Courier issue of May 10, he will cover the greater part of the Continent and Great Britain during the four months allotted for the investigation.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, left Washington on May 15 to visit points in the States of South Carolina, Alabama, Texas, New Mexico, Arizona, California, Oregon, Washington, North Dakota, Minnesota, Wisconsin, and Illinois, for the purpose of conferring with experiment station officials and field men and of supervising cooperative smut investigations and the publication of experimental results. He will return to Washington early in July.

C. W. Warburton, who left Washington on March 21, to supervise the making of seed loans to farmers in crop-failure areas to purchase seed of wheat, oats, barley, and flax out of the $1,500,000 fund created for that purpose, returned on May 20. The blank forms for making applications for loans were printed after the act was signed on March 20, shipped from Washington to Grand Forks, N. Dak., distributed to farmers, and completed applications returned, so that the first checks were issued on April 1. During the month of April more than 15,000 applications for loans were received at the Grand Forks office. By May 13 more than 11,000 loans had been completed for a total of $1,337,000. Enough additional loans were completed during the week ending May 20 to bring the total number to nearly 12,000 and the amount around $1,400,000. A few applications are still pending awaiting receipt of information which has been requested, so that only a small balance will be left in the fund

Crop conditions are more favorable in western North Dakota and in Montana than they have been since the spring of 1916. Most of this region was covered by a heavy snowfall during the winter, which went off gradually so that the moisture was absorbed by the soil. Spring rains have been sufficient to maintain favorable conditions and seeding is now practically completed. The seeding season is later than usual and this fact will result in a decrease in the acreage of spring wheat and a probable increase in the acreage of oats, barley, and flax. The condition of North Dakota's very large acreage of winter rye is satisfactory.

Gustav A. Wiebe, was appointed junior plant breeder, effective May 3, to have charge of the cereal experiments of the Office at the Aberdeen Substation, Aberdeen, Idaho, vice Arthur E. McClymonds, who, as noted in a recent Courier issue, has become Superintendent of the Substation as an employee of the Idaho Agricultural Experiment Station.

Allen P. Willis has been given an appointment, effective June 16, to assist Dr. C. E. Leighty in the cereal experiments conducted by this Office at Arlington Farm, Va. Mr. Willis has previously been in the employ of this Office at the Arlington Farm.

VISITORS

Bert Ball, Director of Plans, Spring Wheat Crop Improvement Association, of Minneapolis, who was in attendance on the recent conference on Quarantine No. 37, visited the Office on May 15 to discuss suggested cooperative use of a colored plate illustrating the common barberry, which the Association is in process of preparing.

Dr. J. A. Le Clerc, of the Miner-Hilliard Milling Co., Wilkesbarre, Pa., who recently spent four months in Europe investigating and encouraging the possibility of a larger use of American corn in European countries, conferred with officials of this Office on May 16 on the promotion of this project by different agencies in the United States.

A committee from the Paint and Varnish Manufacturers' Association visited the Office on May 12 to discuss the present situation in seed-flax production in this country and to offer their assistance in any possible way in reviving and extending this farm industry. The committee consisted of Ludington Patton, of the Pittsburg Plate Glass Co., Milwaukee, Wis., B. W. Cooper, Secretary of the Geo. D. Wetherill & Co., Inc., Boston, Mass., and E. H. Hancock, Vice-President of the Louisville Varnish Co., Louisville, Ky.

R. N. Wilson, Executive Secretary of the Agricultural Legislative Committee of California, with headquarters at Sacramento, was an Office visitor on May 17 to discuss the work being done by this Office in California. The Legislative Committee represents 27 organizations of California crop and live stock producers, including the Rice Growers' Association of California, and is a standing committee to consider State legislation affecting agriculture. Mr. Wilson also is a member of the committee investigating different types of organization and control of agricultural institutions throughout the country under instructions from the State legislature to make recommendations as to the organization, location, and direction of the State agricultural Educational agencies in California.

MANUSCRIPTS AND PUBLICATIONS

The paper entitled "Germination of Barley Seeds Harvested at Different Stages of Growth," by Dr. Harry V. Harlan, agronomist in charge, and Merritt N. Pope, agronomist, Barley Investigations, mentioned in the Courier of April 20, has been accepted by the Journal of Heredity for publication at an early date.

TRANSLATIONS

David St. Zur Frage ueber die Wirkung des Formaldehyds auf Getreidesamen und Brandsporen. Resume. (On the effect of formaldehyde upon cereal seed and smut spores.) Sitzungs-Ber. Naturf. Ges. d. Univ. (Jurjeff,) Dorpat, Vol. 12, Heft 2, 1899. (Date of publication, Jurjeff, 1900)

Gassner, G. Beiträge zur Frage der Ueberwinterung und Verbreitung der Getreideroste im subtropischen Klima. (Contributions to the question of hibernation and dispersal of the cereal rusts in subtropical climate.) Zeitschr. f. Pflanzenkrankh., 26:329-374, no. 6/7. Stuttgart, 1916.

Kühn, J. Die Krankheiten der Kulturgewächse, ihre Ursachen und ihre Verhirtung. (Diseases of cultivated plants, their causes, and prevention.) Berlin, 1859. 2. ed.

Nilsson-Ehle, H. Berättelse öfver förädlingsarbetena med höstvete vid Svalöf 1910-1912. (Report on the investigations dealing with the improvement of winter wheat at Svalöf, 1910-1912.) Sveriges Uts. för. Tidsskr., Year XXII, heft 6, p. 307-334. 1912.

- - - - - Sammanställning af resultaten från Utsädes föreningens hittills utförda jrnförande försök med olika höst-hvetesorter. (Synopsis of the results of the comparative experiments with various sorts of autumnal wheat made by the seed association.) Sveriges Uts. for. Tidsskr. Year XVI, p. 189-308. Malmö, 1907

Ravn, F. K. Saatidens Indflydelse paa Fremkomsten af Stövbrank hos Havre. (The influence of the time of seeding upon the appearance of Ustilago avenae.) Tidsskr. Landbrug. Planteavl., 7:142-148. Copennagen, 1901.

Remy, Th. Einiges ueber die Beschaffenheit des Saatgutes letzter Ernte. (The quality of the seed of last harvest.) Landw. Zeitschr. für die Rheinprovinz, new series, 15th year, p. 24-26. Bonn, 1914.

Remy, Th., and Vasters, J. Beobachtungen ueber Chlorphenolquecksilber als Pflanzenschutzmittel. (Observations on Chlorphenol-mercury as a fungicide.) Illustr. Landwirt. Zeitung, 34th year, p. 769-771. Berlin, 1914.

Reutner. Die Fuszkrankheit des Weizens. (The take-all disease of wheat.) Deutsche Landwirt. Presse, 34th year, p. 780 (folio.) Berlin, 1913.

Riehm, E. Prüfung einiger Mittel zur Bekämpfung des Steinbrandes. (Experiments with some fungicides to combat bunt or stinking smut.) Mitth. aus d. Kais. Biol. Anst. f. Land. u. Forstwiss., Heft 14, p. 8-9. Berlin 1913.

Riehm, E. Brandpilze. (Smuts.) Centralbl. f. Bakt., Parasit., u. Inf.-Krankh., 44:390-393, pt. 2. Jena, 1916.

Spieckermann, A. Beiträge zur Saatgutbeize. (Contributions to the knowlegge of fungicides.) Illustr. Landwirt. Zeitung, 34th year, p. 665-666. Berlin, 1914.

Vasters, J. Uspulunbehandlung des Saatgutes als Mittel der Saatgutersparung. (Uspulun treatment of seed from an economic point of view.) Landw. Zeitschr. f. d. Rheinprovinz, new series, 16th year, p. 64-66. (4°) Bonn, 1915.

These supplement the list of available translations of foreign papers on cereals and cereal diseases given in the Cereal Courier, volume 13, pages 12-15, 52, 69, and 225-226, and volume 14, pages 38, 39, and are available in the Bureau of Plant Industry Library.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). No report.

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamerly) (May 12.) "I have just finished transplanting and have hoed my corn plat; it is too wet to put a plow in. The corn is about four inches high in all but six rows. I have an absolute stand and some to spare."

VIRGINIA

Arlington Farm, Rosslyn (Cereal Project, J. W. Taylor) (May 12). The prolonged spring drought was broken May 3 and 4, when a much needed rainfall occurred. However, winter grains showed no visible injury from the dry spell, and prospects in general for good crops appear excellent at this date. Wheat, rye, oats, and barley are heading at about their usual dates, which is from 10 to 14 days later than last year. Covered smut and loose smut of barley are prevalent in the varietal experiments where no seed treatment was used. The plats seeded with treated seed for controlling the smuts of barley are later in heading but it is believed some excellent results will be obtained. In wheat a trace of loose smut occurs in Purple Straw and Fultz, while in oats, aurora shows a heavy smut infection. Leaf rust of wheat and rye is present only in isolated cases at this time.

In the varietal experiments with oats, Fulghum and Kanota growing in neighboring plats appear identical. T. R. Stanton has carefully examined the plats and as yet has noted no distinguishing characters. The rapid fall growth was similar as well as the early spring start, and both Fulghum and Kanota began heading April 24 and 25, which is about 10 days earlier than the next early variety grown here.

Several promising barley selections from Dr. Harlan's nursery were transferred to the plats last fall. Two of these now appear to have promise despite the fact that both are heavily stricken with the smuts.

The most prolific occurrence of wheat rye hybrids ever observed at Arlington exists this year. In one afternoon the writer found 76 of these hybrids in the variety Purple Straw, C. I. 1915. On the following day, aided by W. J. Sando, at least 50 more were tagged.

(Corn Project, H. S. Garrison) (May 20). Up to the present time about nine acres on the flats and about five acres on the upland have been planted in experimental corn. Since May 1 the weather has been very favorable for germination and the earlier plantings are up to a good stand.

The first 154 rows of Mr. Richey's corn were planted on May 2 and May 9. These are breeding rows of hand-pollinated ears and strains for use in genetic studies.

Mr. Willier's plantings of White Rice and Yellow Pearl popcorn were made on May 10 and 11. The object is to secure progeny from individual ears of known performance for the purpose of measuring the variation from parental types and to determine as far as possible the extent to which variations in popping, flavor, and other qualities may be controlled by selection and selfing.

In continuation of selection experiments with Boone County White (Selection No. 119), Mr. Garrison planted five strains of this variety in isolated plats of one-fourth to one acre each, on May 9 and 10.

The planting, on the flats, of the breeding rows in the experiments of Messrs. Kyle, Stoneberg, and Garrison, was finished on May 17, between showers These rows comprise self- and cross-fertilized material for further selection crossing, and study.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). No report.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) No report.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) No report.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) No report.

ILLINOIS

Funk Brothers Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, (J. R. Holbert) (May 15). Mr. Benjamin Koehler sowed a series of 911 spring wheat varieties May 6th. Incessant rains prevented an an earlier seeding.

Mr. C. S. Reddy has returned to Bloomington from Madison, Wisconsin to continue his investigations of the bacterial diseases of corn.

Mr. Holbert spent May 5 and 6 in Urbana completing some physiologic experiments that were being conducted in the greenhouses at the University of Illinois in cooperation with Dr. C. F. Hottes and Dr. W. L. Burlison.

Dr. C. M. Woodworth and Mr. George H. Dungan were in Bloomington April 28 and 29 and May 12 and 16 to assist in the packeting of seed for the experiments at Urbana.

Corn root and stalk rot experiments are located this season in 12 counties in Illinois, namely, Kane, Lee, Henry, Grundy, Knox, Peoria, Tazewell, Shelby, Macoupin, Hancock, Champaign, and McLean.

Time-of-planting experiments are being conducted in Knox, Tazewell, and Champaign counties. Soil temperatures and soil moistures are being determined and recorded at each place. Soil treatment studies are being carried on in Knox, Macoupin, Champaign, and McLean counties. The influence of crop rotations on the development and destructiveness of the different diseases is being studied in Peoria, Champaign, and McLean counties. Inoculation studies are being conducted at Bloomington in cooperation with Dr. James G. Dickson. Two of the five large breeding experiments located at Bloomington have already been planted.

This is the second season in which we are using seed composites that are primarily infected with Diplodia zeae, Fusarium moniliforme, and other pathogenic organisms, as well as a composite that is practically free from infection by such organisms. These standard composites have been included in the studies on rotation soil treatment, time of planting, and inoculation at various places in Illinois, Iowa, Kansas, Nebraska, and at Arlington, Va.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) (April resume). During the month of April a resurvey of a number of cities and towns in Cook, Du Page and Lake Counties was made. All of the cities and towsn visited are located within commuting distance of Chicago. In some cases it was extremely difficult to persuade owners of barberry bushes to comply with the Illinois Plant Inspection Act relative to the removal of common barberry bushes. This work resulted in getting over 2000 bushes removed during this month.

The collection of rust spores by aeroplane was started, one flight being made at Chanute Field, Rantoul, Ill., and one at Godman Field, Camp Knox, Ky. There was some delay in getting this work started due to the heavy April rains which were unfavorable for aviation. Plans have been made for exposing spore traps from an aeroplane over the wild barberry area near Gurnee in Lake County, Illinois, provided those barberries become infected. From this we hope to get data as to the occurrence of aecia spores in the air, and at what altitude they can be found. All this work is being carried on in cooperation with the U. S. Army Air Service.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root Stalk, and Ear Rots, G. N. Hoffer) No report.

(Leaf Rust Investigations, H. S. Jackson and E. B. Mains) No report.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (April resume). The entire month of April was spent in checking for sprouts and in observing severity and distribution of rust infection on barberries in western Ohio. Greene, Butler, Montgomery, Preble, Darke, Mercer, Van Wert, Paulding, Defiance and Henry counties were covered in the order named.

Rust was first found on barberry in northern Greene County on April 11. The rust was in the pycnial stage on that date. Cluster cups on barberry were first observed on April 17 in southern Montgomery County. On the same day 72 rust spots were discovered on one barberry leaf, the size of a quarter, near West Carrollton, in Montgomery County.

The following rust records were made from data obtained between April 11 and May 1.

Date	Location	Severity	Stage
April 11	North central Greene County	light	pycnial
" 13	Southern Montgomery County	moderate	"
" 17	Southern Montgomery County	heavy	aecial & pycnial
" 17	Southern Montgomery County	"	" " "
" 17	Southern Montgomery County	light	pycnial
" 17	Southern Montgomery County	"	"
" 17	Central Montgomery County	"	"
" 18	South Western Montgomery County	moderate	"
" 18	South Western Montgomery County	"	"
" 18	South Western Montgomery County	light	"
" 18	Western Montgomery County	moderate	"
" 18	Western Montgomery County	heavy	"
" 18	Central Montgomery County	"	"
" 19	Western Montgomery County	light	"
" 19	North Eastern Preble County	heavy	"
" 20	South Eastern Darke County	moderate	"
" 20	Western Darke County	"	"
" 20	North Central Darke County	light	"
" 21	East Central Darke County	"	"
" 21	North Eastern Darke County	"	"
" 21	South Central Mercer County	moderate	"
" 21	Central Mercer County	"	"
" 22	Western Mercer County	heavy	"
" 22	North Western Mercer County	moderate	"
" 26	North Central Paulding County	light	"
" 26	West Central Defiance County	"	"
" 27	South Western Defiance County	"	"
" 28	Central Henry County	trace	"

The writer talked on "Barberry Eradication in Ohio" at a sectional meeting of the annual assembly of the Ohio Academy of Science held at Ohio State University April 14-15, inclusive.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (May 15). We have revisited every location in Monroe County, both rural and city and did not find a sprout. We rejoiced.

But things have taken a turn in this county (Lenawee). We have rechecked the city of Adrian and have found sprouts in four locations out of 67. We visited five rural locations this afternoon and found sprouts in one, also infections on the sprouts. The material was very limited and was mailed to Mr. Lambert at University Farm.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) No report.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) No report.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (May 16). The spring so far has been cool, moist, and backward. The second seeding in the date-of-seeding experiment which should have been made on May 1 was made on May 2 and emerged on the 9th. A slight rain on the night of the 14th and 15th delayed the third date-of-seeding also. The third seeding will be made this afternoon. The present indications are that it will rain soon.

Recent weather conditions have been almost ideal for wheat, but the stands seem to be too thin to make any high yields. Most of the wheat is in the boot at this time.

Most of the seed heads of sorghums have been thrashed and are ready for seeding.

Maximum temperature for May to date, 86° on the 5th and 9th, minimum temperature, 45° on the 14th. The precipitation recorded is as follows:

May	1	0.41 inch.
"	2	0.01 "
"	8	2.60 "
	11	0.32 "
	15	0.26 "
	Total	3.60 "

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) No report

Hays Branch Experiment Station, Hays (A. F. Swanson) (May 16) Since May 1 we have had 0.63 of an inch of rain, or a total of 7.22 inches for the year; 4.95 inches of this was recorded in April. While the nights are still chilly the days have been warm and pleasant and crops are making satisfactory growth.

Spring crops, such as oats and barley, have just reached a stage where the moisture requirement is high. The barley is now about 12 inches tall with the heads in the boot. The oats is practically as far along. Spring wheat is more promising than it has been for several years. Frequent rains will be needed, however, to bring these crops through.

The spring-sprouted spring wheat has made rapid growth during the past week. Wherever it is thin on the ground it is stooling well, but under such conditions weeds are now becoming a factor. On the Cereal Project several different methods of cultivations were tried earlier in the spring. Where the Acme harrow was used a considerable number of weeds were killed. While the wheat was damaged to some extent in the operation yet it is believed that some benefits have resulted. The Halleck harrow also was used at a time when the weeds were very tender but thick on the ground. There is a freedeom from weeds on this area and the thin wheat is stooling and making a good growth. The spring-sprouted winter wheat which came up thick is holding its own against the weeds.

Another field of winter wheat which failed to come up before spring, and then with a poor stand, was seeded to barley. The barley is making a good growth with prospects that it will be a better paying crop than that which might have been received from a thin stand of wheat.

Seventeen varieties of corn were planted this year in comparison to ten last year. The planting was made May 5. Three drought-resistant varieties were received from the Office of Cereal Investigations. Two local selections grown by Messrs. Joy Bros. near Hays for a number of years are included in the test.

Forty-five different varieties and strains of sorghums were seeded in the varietal test on May 11.

Six different rate tests of kafir will be grown this year. Beginning with May 5, and continuing for intervals of ten days until June 15, a date test with Dawn kafir and Dwarf yellow milo will be run.

The sorghum nursery includes 350 selections of various strains. One series is grown on fallow land, the other on cropped land. Five new importations from India are included in the test. Seventy-five selections of the Red Amber x Feterita cross are again included. One series of these selections has been smutted to test for smut resistance. In order to be able to keep certain varieties and strains of corn as pure as possible they have been distributed throughout the sorghum nursery. By proper distribution the corn also helps to keep certain strains and varieties of sorghums separated and will aid in a small way against cross pollination.

Dawn kafir, Pink kafir, Feterita, Dwarf yellow milo and Freed sorgo will be grown in large fields or in increase plats for pure seed and distribution.

Farmers are busy with row crops at this time. Some ground is being prepared for fallow, especially where fields of wheat give little indication of a crop.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (May 15) Weather conditions during the first half of May have been favorable for spring work. During the period from May 10 to 12, a rather severe wind storm was experienced but the damage done to growing crops was not great. The heavy precipitations during the latter part of April left the soil in excellent condition as to moisture. A few showers were recorded during the past half-month, and soil moisture conditions are very good at the present time.

During the past two weeks the temperatures have been rather low, but practically no freezing temperatures have been recorded since the first of the month. At the present time fruit trees are in full bloom. The blossoms are very numerous this season and if frosts do not occur to blight them, considerable of a fruit crop should be produced.

All of the cereal crops are growing well since the rains of the latter part of April. The stands of spring wheat are excellent, but in many of the plats and rows of winter wheat poor stands are to be seen. The preparation of corn ground has begun. Corn planting probably will start before the end of the present week.

During the past two weeks Superintendent Brandon has been very busy in laying out roads and making tree and shrubbery plantings around the farm buildings. When completed this will be a very great improvement.

Visitors during the past two weeks have been Supt. F. L. Kelso of the Ardmore (S. Dak.) Station, Professors Kidder and Jay of the Extension Department of the Colorado Agricultural College, and County Club Leader R. W. Vance of Washington County, Colo.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) No report.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (May 17). The weather of the first half of May was cool and rainy. Precipitation was recorded on all but two of the 15 days, but the total precipitation for the period amounted to only 1.42 inches. Maximum temperature for the period, 78° on May 2; minimum, 37°, on May 3 and 12.

The cereals and early-sown flax are up with good stands. Present prospects are unusually favorable for a good, damp growing season.

The wheat biologic form nursery was sown May 9 and is emerging today. The spring wheat F_1 hybrids were sown May 13. Seeding was somewhat delayed on account of the wet weather and wind. It was blowing hard and drizzling intermittently all day May 13 thus making the seeding operation very unpleasant. Some of the F_2 progenies were sown yesterday, May 16 and the remainder will be sown as soon as it is dry and calm.

Mr. A. C. Dillman arrived today.

Dickinson Substation, Dickinson (Ralph W. Smith) (May 15) During the first half of May cool, windy weather prevailed, with frequent showers during the past week. There has been no frost this month, partly because of cloudy weather and windy nights. The total precipitation for the first half of the month was 1.45 inches, which is somewhat above normal.

The seeding of small grain is nearly completed in this locality and corn and potatoes are being planted. The acreage of corn and especially of potatoes will be larger than usual here this year.

Crop conditions are promising at this time. The recent rains have greatly benefited growing crops and left the soil in excellent condition for seeding the later sown crops.

Corn varieties at the Substation were planted today. Other cereal crop varieties have been sown, with the exception of flax and proso millet, which will be sown in the near future.

Visitors this month included Mr. J. C. Diamond, Agricultural Statistician for North Dakota and Supt. U. J. Powney of the Hettinger (N. Dak.)Substation.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) No report.

WESTERN BASIN AND COAST AREAS
(North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) No report.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (May 13) Cold weather prevailed during practically the entire month of April. There were thirteen days of the month with minimum temperatures below freezing. The lowest temperature during the month was 29° and the highest 61°. The total precipitation for the month was only 0.38 of an inch, 0.14 of an inch being the greatest amount for any 24-hour period.

Winter wheat made comparatively little growth during the month. On account of late fall sowing much of the winter wheat in this section did not emerge until spring. The soil is badly crusted and there was not enough rain at any time during the month of April to soften this crust, which has apparently interfered with the proper growth of the wheat. On the Station, winter wheat which was harrowed early in April when the crust was soft made somewhat more vigorous growth than the unharrowed wheat.

In the southern part of the county where Fortyfold, Turkey, and Triplet winter wheats are grown, much of the Fortyfold has had to be resown. A little Turkey wheat has also been resown but in practically every instance the stands of Triplet are from fair to good.

All spring wheat varieties on the Station have emerged with good uniform stands.

CALIFORNIA

Biggs Rice Field Station, Biggs, (J. W. Jones) No report.

University Farm, Davis (V. H. Florell) No report.

Agricultural Experiment Station, Berkeley (W. W. Mackie) No report.

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 14 May 31, 1922 No. 11
Personnel (May 21-310 and Project Issue.

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PERSONNEL ITEMS

Floyd G. Anderson and Harry L. Sixon were appointed field assistants, effective June 16, and June 1, respectively to assist in barberry eradication with headquarters at Urbana, Ill.

Dr. C. R. Ball visited recently the extensive rotation experiments conducted by Dr. W. W. Garner, physiologist in charge of tobacco and plant nutrition investigations, at Upper Marlboro, Md. These rotations include corn, wheat, oats and rye among the cereals and have been so planned and conducted as to yield very important data on the effect of these and other crops in rotation with tobacco.

J. Allen Clark, agronomist in charge of western wheat investigations, left Washington on May 29 to visit field stations in Kansas, California, Oregon, Washington, Idaho, Utah, Colorado, Nebraska, Minnesota, North Dakota, and Montana to study cooperative cereal experiments with wheat. In addition to the varietal experiments, Mr. Clark plans to spend considerable time in the study of material in breeding nurseries in Kansas, California, Oregon, Minnesota, and North Dakota. At the conclusion of the trip outlined he will remain at University Farm, St. Paul, Minn., until about Dec. 31, to make a special study of inheritance in a cross between Kota and Hard Federation wheats, from material that is being grown this year at Davis, Calif., Mandan, N. Dak., and St. Paul, Minn. Mr. Clark has been given permission to pursue post-graduate study in genetics and plant pathology while at University Farm, St. Paul.

Thomas J. Fitzpatrick, Ralph D. McDermott and Walter O. Weaver were appointed field assistants, effective June 1. to assist in barberry eradication, with headquarters at Lincoln, Nebraska.

Edwin D. Griffin was appointed field assistant, effective June 16, to assist in barberry eradication, with headquarters at Urbana, Ill.

Miss Marion Griffiths, assistant pathologist in smut investigations, left Washington on May 23 for Granite City, Ill., where she took notes on the cooperative experiments with flag smut of wheat that are under her charge. Prof. Geo. H. Dungan, representing the Illinois Agricultural Experiment Station, conferred with Miss Griffiths at Granite City and recorded similar data for use in cooperative study at Urbana, Ill. Miss Griffiths returned to Washington on May 29.

J. M. Hammerly, assistant in corn investigations, who has been at Florence, S. C., since April 11 to supervise the corn breeding experiments conducted in cooperation with the Pee Dee Substation, returned to Washington on May 29. He reports that the stand of corn in the experimental plats has been damaged by insects known as "cud-worms." He also states that crops in general in the vicinity of Florence are very poor because of excessive moisture.

Dr. G. N. Hoffer, pathologist and agent of this Office, and associate botanist of the Purdue University Agricultural Experiment Station, arrived in Washington on May 27 to confer with members of this Office and with representatives of the research staff of the National Canners' Association on plans for research during this year and next on the root, stalk, and ear rots of corn. Dr. Hoffer returns today to La Fayette, Ind. He will stop en route at Hershey, Pa., to confer with farmers on corn improvement in that locality.

Dr. A. G. Johnson, pathologist of this Office, and associate professor of plant pathology at the University of Wisconsin, arrived in Washington on May 29. On June 30, 1922, Dr. Johnson will resign his official connection with the Wisconsin Agricultural Experiment Station and thereafter will have permanent headquarters in Washington, D. C., and will give full time to this Office, continuing in charge of the investigations of diseases of cereals caused by imperfect and sac fungi. These include root, stalk, and ear rots of corn, wheat scab, take-all and related diseases of cereals, the Helminthosporium diseases of barley, flax wilt and flax canker, various diseases of rice, ergot diseases of cereals, the bacterial diseases of corn, the nematode diseases of wheat and rye, and others.

Ray T. Kelsey and William W. Ridenaur were appointed field assistants, effective June 1, to assist in barberry eradication with respective headquarters at Amboy and Mt. Vernon, Indiana.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, left Washington on May 24 for Knoxville, Tenn., to take notes on and harvest the wheat grown in the breeding nurseries maintained in cooperation with the Tennessee Agricultural Experiment Station. He returned to Washington on May 31.

Dr. E. B. Mains, agent of this Office, and associate in botany at the Purdue University Agricultural Experiment Station, La Fayette, Ind., arrived in Washington on May 29. He is completing a field trip in the interests of leaf-rust investigations. While in Washington Dr. Mains will take notes on Dr. Leighty's extensive varietal nursery at Arlington Farm. A fairly general epidemic of leaf rust has developed, thus affording an unusual opportunity for a study of the relative resistance and susceptibility of different varieties of wheats and promising hybrids. Dr. Mains also will take notes on the resistance of different varieties of rye and barley to their respective rusts.

John H. Martin, agronomist in western wheat investigations, left Washington on May 26 to spend the summer months in the study of wheat hybrids at various points in North Dakota, Kansas, Colorado, Minnesota, Iowa, Nebraska, Montana, and Idaho. He also will study cooperative experiments with wheat and the conditions that obtain at points where they are being conducted.

Forrest D. McCrea was appointed field assistant, effective June 10, to assist in barberry eradication, with headquarters at Attica, Ind.

Jesse H. Muncie was appointed assistant plant pathologist, effective June 16, to take over the direction of the barberry eradication campaign in Iowa, with headquarters at Ames, Iowa.

Merida P. Nichols was appointed teamster, effective June 1, at the Aberdeen Substation, Aberdeen, Idaho, to succeed J. G. Fisher who resigned on May 5.

John T. Pearson was appointed on May 15 as field assistant in Cereal Investigations, to assist in experiments with the root disease of cereals that are being conducted cooperatively with the Kansas Agricultural Experiment Station at Abilene, Kans. Mr. Pearson was employed in the same work last year.

Merritt N. Pope, agronomist in barley investigations, left Washington on May 29 to spend the summer in making genetical, physiological, and taxonomic studies in barley nurseries maintained in the States of Colorado, California, Oregon, and Idaho, for the purpose of breeding barley varieties. He also will confer with officials of agricultural experiment stations and field men concerning experiments with barley. He will return to Washington about the middle of August.

VISITORS

Dr. L. H. Pammel, head of the department of botany, Iowa College of Agriculture, Ames, Iowa, was an Office visitor on May 26, to discuss rust investigations and barberry eradication.

G. Renaux, agronomist, of Brusque, St^a. Catharina, Brazil, a graduate of the E. S. de Agricultura do Ministerio da Agricultura, was an Office visitor on May 23. Mr. Renaux was at one time a student at the Kansas Agricultural College, Manhattan, Kans.

Dr. N. Van Poeteren and Dr. E. Van Slogteren, chief and member, respectively, of the Phytopathological Service of Holland, who, as representatives of the Netherlands Government, were in attendance at the formal session of the Plant Quarantine Conference called by the Department on May 15, were visitors at the Office on May 22.

MANUSCRIPTS AND PUBLICATIONS

Department Bulletin 1046, entitled "Rust Resistance in Winter-Wheat Varieties," by Leo E. Melchers, plant pathologist, and John H. Parker, in charge of crop improvement, Kansas Agricultural Experiment Station, both agents of this Office, has been received from the Government Printing Office.

Page proof of the manuscript entitled "Wheat Growing after Fallow in eastern Oregon," by D. E. Stephens and Geo. R. Hyslop, was read by Mr. Stephens about the middle of May. This manuscript is to be published as a bulletin of the Oregon Agricultural Experiment Station.

Department Bulletin 1062, entitled "Relation of the Character of the Endosperm to the Susceptibility of Dent Corn to Root Rotting," by John F. Trost, was received on May 24.

218-A INVESTIGATIONS OF IMPERFECT AND SAC FUNGI (Dr. A. G. Johnson, Pathologist in Charge).

INVESTIGATIONS OF TAKE-ALL, WHEAT ROSETTE, AND OTHER FOOT ROTS. (H. H. McKinney, assistant pathologist).

On April 18, H. H. McKinney, in company with Professor L. E. Melchers, visited the cooperative experimental plats located near Abilene, Kansas, where the field experiments are being conducted on the foot-rot disease or diseases occurring on wheat in that state. This was the first visit made to the plats this spring.

The wheat was from six to eight inches high on most of the plats. Practically all of the varieties growing on the plats stood the winter very well. There was considerable evidence of field spotting on a large plat sown to Kanred wheat which was suggestive of foot-rot. There was no indication of yellowing of plants in these spots or of a blackening at the base of the culms of these plants. The plants were shorter in the spots and they showed evidence of having fewer tillers than was the case with the plants outside of the spots.

Helminthosporium lesions were found on the bases of a small percentage of plants in and also outside of the field spots. There was no evidence of fruiting bodies of any other fungus.

On May 7, H. H. McKinney, in company with Mr. Pearson, visited the plats again. At this time the wheat was knee high and the field spotting was very much in evidence, but as yet no yellowing of the plants or blackening of the culm bases had taken place in the spots. This is contrary to the results of last year when the yellowing and blackening was evident much earlier in the season. On this trip Helminthosporium was found to be much in evidence on plants both in and outside of the spots.

The Harvest Queen variety growing in the Abilene varietal series showed some Helminthosporium infection, but in no case was there any evidence of the rosette disease as it occurs on this variety in the infested plats located near Granite City, Illinois.

On May 20, Professor L. E. Melchers visited the Abilene plats and some of the farms on which foot-rot developed last year. At this time there was evidence of the foot-rot condition found last year both on the experimental plats and on the farm of Mr. Engle. At this time the pycnidia of Wojnowicia graminis were found on wheat and on Agropyron smithii.

On May 26 examinations were made of wheat plants growing at Madison, Wisconsin, in soil from soil infested with foot-rot obtained near Abilene, Kansas. At this time there was no indication of foot-rot as the disease occurs in Kansas. This probably is due to seasonal conditions, as likewise seems to be the delayed appearance of the disease this year in Kansas.

Further work being carried on at Madison, Wisconsin, by the writer indicates that Wojnowicia graminis is pathogenic on wheat, but it is not known how virulent the organism may be. Seemingly pathogenicity is influenced by environmental factors. Work now under way will throw further light on this point.

Helminthosporium sativum isolated from Abilene wheat is pathogenic on wheat and seemingly is capable of causing the same type and degree of injury produced by the strains of this organism which have been isolated from wheat at Granite City, Illinois, and elsewhere. It is quite probable that the foot-rot occurring near Abilene is at least accentuated by Helminthosporium. Whether or not this organism initiates the trouble and Wojnowicia graminis follows on behind, producing further symptoms, is not known. Certainly the symptoms produced by the foot-rot disease occurring near Abilene are very different from those ordinarily produced when Helminthosporium is the sole cause. The exact relation of these two fungi to the disease can be determined only after further study.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 14 June 10, 1922 No. 12
Personnel (June 1-10) and Field Station (May 16-31) Issue.

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PERSONNEL ITEMS

Burton B. Bayles, unskilled laborer in the cooperative cereal disease investigations at Manhattan, Kans., resigned his position on June 6, 1922.

Fred N. Briggs writes from Berkeley, Calif., on May 21: "You will be interested to know that I received my M. S. degree from the University of California on May 17. I am very proud of it and I surely appreciate the privilege granted me by the Department in allowing me to do post-graduate work while a member of the staff of the Department. I plan to start working for my doctorate next fall and shall ground myself well in the fundamental sciences, as you suggested. As soon as I make out my course of study, I will submit it to you for approval."

José L. Decena, a graduate of the Tarlac (P. I.) High School, who will enter Purdue University in the fall, has been given an appointment as field assistant, effective June 1, to assist in routine work connected with investigations of corn diseases under the direction of Dr. G. N. Hoffer, at La Fayette, Ind.

A. C. Dillman writes as follows from Manlan, N. Dak., on June 6: Hot dry weather has prevailed the past few days and the crops are very much in need of rain. A maximum temperature of 96° F. was recorded yesterday, which is nearly a record for this locality at this season.

I think Mr. Brinsmade plans to leave the morning of the 8th. All of our seeding has been finished, with the exception of the date-of-seeding experiment of flax which is to be done on June 15. Germination has been somewhat uneven on account of the dry weather.

Benjamin F. Dittus has been appointed field assistant, effective June 1, to assist in barberry eradication in Nebraska, with headquarters at University Place, Nebraska.

Dr. F. E. Kempton, in charge of barberry eradication, left Washington on June 6 to attend a conference at Chicago on June 9 with Mr. Lambert, acting in charge of rust epidemiology studies, Mr. Curran, State leader of barberry eradication in Illinois, Dr. Hoskins, botanist in charge of ecological investigations in barberry eradication, and others, on some new problems that have arisen in connection with the area of escaped bushes near Gurnee, Lake County, Ill. After the conference he expects to stop at La Fayette, Ind., and Columbus, Ohio, before returning to Washington on June 14.

Dr. F. E. Kempton and Dr. H. B. Humphrey, pathologist in charge of barberry eradication and cereal disease investigations, respectively, returned on Tuesday morning, June 6, from a two-day automobile trip in the wheat-growing sections of south-central Pennsylvania, where they made observations on the distribution of the common barberry and the presence of stem rust and orange leaf rust of wheat. (A discussion of their observations will be found under Pennsylvania in FIELD STATION CONDITION AND PROGRESS)

Dr. E. E. Mains, who has been in Washington since May 29, completed his taking of notes on leaf-rust infections at Arlington Farm on June 7 and left for short stops at the State agricultural experiment stations at Blacksburg, Va., and Lexington, Ky., after which he will return to his station at Purdue University, La Fayette, Ind., where he expects to arrive about June 11.

Charles H. Miller and Ralph H. Rogers have been appointed field assistants, effective June 1, to assist in barberry eradication in Indiana, with headquarters at La Fayette.

Merritt N. Pope writes that he arrived at Davis, Calif., on June 4 after a profitable visit with F. A. Coffman, of the Akron Experiment Farm, Akron, Colo. Mr. Pope will remain at Davis, Calif., working in the barley nursery, until about June 15. He will then inspect barley experiments at Moro, Oregon, and Moccasin, Mont., enroute to Aberdeen, Idaho, where he will spend the month of July.

The following letter from Dr. E. C. Stakman, presumably written at Paris, and received in this Office on June 3, is given verbatim:

"Arrived O. K., but feeling somewhat pale greenish-yellow. I discovered that the only sure preventive of seasickness is to keep off the water.

In order to avoid using too much material, postal and otherwise, I am enclosing transportation request stubs. I finally succeeded in getting my steamship transportation just about 45 minutes before sailing time; consequently I didn't send the stubs in at once.

Barberry is just beginning to rust in this region; there is no P graminis on grains or grasses; P glumarum is starting vigorously (see specimens sent through Office of Pathological Inspection); there is no P triticina so far as I have been able to find, but there is P dispersa on rye. I couldn't find any P simplex on barley, neither P coronata on oats, although I have seen only a "few oats." P. bromina was fairly common on Bromus sterilis near Cherbourg but there was none on B. mollis. P holcina was moderately abundant on Holcus lanatus. Dactylis glomerata, Arrhenatherum elatius, Poa compressa, Alopecurus agrestis were all free from rust. A careful study of the grass hosts for P. glumarum has not been made in France, according to Dr. Foex.

I shall probably stay here for several days longer. Yesterday I was at the Agr. School, Ecole National d'Agriculture at Grignon; to-day I am going over the herbarium specimens at the Station de Pathologie Vegetale; tomorrow I expect to go to Brie with Prof. Ducomte, then one day with

Schribaux, one with Vilmorin and then I shall probably go to southern France and to Spain. All of the places or men mentioned are within a few miles of Paris. So this is the logical center of things pathological. Walker and Spaulding both have been here and Walker may be back soon.

No sight seeing yet, except what I saw incidentally in going to and from Grignon, the Station de Pathologie Vegetale, etc. It has been so not that I haven't felt much like doing anything after a day in the fields.

It is easy to get intoxicated for 10 cents, although I haven't become pickled yet.

With best regards.

(Signed) E. C. Stakman."

Miss Olive F. Tenney, clerk, in the cooperative cereal disease investigations at Manhattan, Kans., resigned her position on June 6 to do clerical work for the Kansas Crop Improvement Association.

John F. Trost writes from La Fayette, Ind., under date of June 1, that he has completed work in preparation for the master's degree at Purdue University and expects it in June.

C. W. Warburton served as consulting specialist at the monthly meeting of the Crop Reporting Board of the Bureau of Markets and Crop Extimates on June 8. Carleton R. Ball served in a similar capacity at the May meeting of the Board.

VISITORS

Mr. G. Renaux, of Santa Catharina, Brazil, whose visit to the Office was mentioned in the Courier of May 31, and Mr. H. A. Traveres, of Bahia, Brazil, visited the Arlington Farm on May 27, in company with C. H. Kyle and T. R. Stanton, to inspect the experimental plats devoted to cereals. Mr. Renaux is interested particularly in varieties of winter oats and soft winter wheats, as he believes these grains will be of value for his section of Brazil, which is now entering upon a period of agricultural development. He was presented with small samples of seed of the more important varieties of winter oats, winter wheat, and barley. Since leaving Brazil, Mr. Renaux has spent some time in Denmark in the study of agricultural conditions. He took also a course in cereal agronomy at the Kansas Agricultural College during the fall semester of the current college year. He expects to return to Brazil via New York on June 10. Mr. Traveres has been in this country for about two years, being interested primarily in cotton production. He has spent some time in studying experiments with cotton at Athens, Ga., and at Florence, S. C.

Prof. R. G. Stapledon, professor of agricultural botany in the University of Wales, and plant breeder of the agricultural experiment station connected therewith, arrived in Washington on the evening of Monday, June 5. He expects to spend between nine and ten weeks in the United States, sailing from Montreal, Canada, on August 12. During that time he will study plant breeding methods and methods of conducting experiments with field crops throughout the eastern half of the United States and Canada. He is interested especially in wheat, oats, and temperate forage crops, such as timothy, clover, etc.

He will remain in Washington until about June 11, spending his time with the various specialists in the offices and at Arlington Farm. He will then start out to visit State and Federal experiment stations. As tentatively planned, this first trip will cover the State agricultural experiment stations at Knoxville, Tenn., Lexington, Ky., Columbia, Mo., Manhattan, Kans., and Ames, Ia. After that he will proceed to Montreal, Canada, to attend a meeting beginning June 26 and lasting several days. Following this meeting he will visit numerous experiment stations in the northern States from New York to Minnesota and the adjacent Provinces in Canada.

MANUSCRIPTS AND PUBLICATIONS

Galley proof of Department Circular 229, entitled "Wild Rice," by Charles E. Chambliss, was read on June 9.

SPECIAL MEMORANDA

MEMORANDUM FOR HEADS OF OFFICES

Operation of Motor Vehicles.

Gentlemen:

In order to protect the interests of the public, the Department and those of our employees who operate motor vehicles, it is important that any one driving a Government-controlled motor vehicle shall have complied with the local regulations covering motor vehicle drivers, as the securing of necessary motor operator's permits, etc. Those employees of the Bureau who are responsible for vehicles owned, loaned, or rented by the Department will be held responsible to see that any one permitted to operate a Government machine shall have complied with State or local requirements.

It is suggested that Bureau employees who are likely to drive motor vehicles when visiting a field station or in the field carrying out investigational activities provide themselves with motor vehicle operator's permits at their headquarters. I understand that with but few exceptions an operator's permit issued by one State is recognized by other States. In case of an accident this would protect both the man and the Department from criticism.

It is expected that employees of the Bureau responsible for the operation of motor vehicles will arrange for the necessary license plate and otherwise comply satisfactorily with local requirements in the matter of registering the machine.

Fees for motor operator's licenses and for registration and license tags cannot be paid from Government funds.

Very truly yours,

(Signed) Wm. A. Taylor

June 9, 1922. Chief of Bureau.

MEETING OF WESTERN AGRONOMIC CONFERENCE.

Word has been received that it has been decided recently to change the location of the Sixth Annual Meeting of the Western Agronomists from Bozeman, Montana, to Pullman, Wash., and Moscow, Idaho. Pullman and Moscow are only ten miles apart and arrangements can be made conveniently for holding the meeting at Pullman in the first half and at Moscow during the second half of the period. As a result of this plan those in attendance will be able to visit the experiment fields of both Stations. The dates set for this meeting are July 20, 21, and 22, 1922.

VOUCHERS FOR AUTOMOBILE RENTAL

Attention is called to Para. 9, Fiscal Regulations, lines 25-34, inc., in connection with vouchers for automobile rental for parts of months at monthly or annual rates. It is the custom of field men to use 30 days as a basis whether the month has 30 or 31 days. On this basis, a voucher covering a 31-day month will not pass the auditors. Vouchers covering automobile rental at a monthly rate for the first half of a 31-day month, that is, from the 1st to the 15th, inclusive, must read 15/31 month, in the column headed "Quantity," and the amount be calculated accordingly; for the last half of such a month, that is, from the 16th to the 31st, inclusive, the voucher must read 16/31 month and the amount be calculated accordingly.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly) (No report).

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor) (No report).

PENNSYLVANIA

Barberry and rust observation. (Report by Dr. F. D. Kempton and Dr. H. B. Humphrey). On their recent two-day automobile trip in the wheat-growing sections of south-central Pennsylvania Drs. Kempton and Humphrey were joined at Shippensburg, Pa., by Dr. F. D. Kern, pathologist of the Pennsylvania State College, who accompanied them on the tour, which included Chambersburg, Gettysburg, York, and Lancaster. Near the town of Shippensburg, a large area of escaped barberry bushes was visited. When first observed two years ago, this area was badly infested with bushes, many of which were from 50 to 70 years old. These old bushes were pulled out shortly after their discovery, but since that time many sprouts and seedlings have come up. Two fields of wheat close to the center of this area, as well as wheat near by, showed stem rust in both the uredinial and telial stages. Severe infection was found only for a few rods distant from the infected barberries, but a trace could be found here and there over the whole field, showing that not only had the rust spread from the barberries to the wheat but that secondary infection had developed from the initial uredinial stage. There were scattered escaped bushes on other farms in the neighborhood although farmers had removed the larger and more conspicuous ones.

Fields of wheat distant from these barberries did not show stem rust infection. A number of photographs were made of large barberry bushes and of sprouts appearing where bushes had been improperly dug. In the territory from Shippensburg via Chambersburg, Gettysburg, York, and Columbia, to Lancaster wheat has a rather uniform appearance and no stem rust was found in such fields as were inspected, except in the vicinity of the common barberry. Numerous barberry bushes were noticed on farmsteads and on city properties throughout the area visited.

An area of escaped barberries about five miles east of Lancaster was examined. A large hedge and many escaped barberries had been removed but some sprouts and many seedlings remained. Scattered escaped bushes were located which had been overlooked on a survey of the area made in 1918, by men from the State College of Pennsylvania. Aecial infection was found in abundance, but, as the cluster cups were just beginning to open, only traces were found in near-by grain fields.

Leaf rust was very abundant in some cases, not only in the vicinity of Shippensburg, but around Chambersburg, Gettysburg, and York. About one-third of the tillable land of this southern portion of Pennsylvania appears to be devoted to wheat this year. All grain is in excellent condition for this season of the year.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (June 1) The spring has been somewhat dry, altho a few days ago a good rain fell and today we are having showers.

The wheat is just beginning to head and with average conditions the harvest will come on rather early at the College Farm. The wheat and oats that were grown in the greenhouse are ripening and a part is now being harvested. A number of new hybrids were made this year with both wheat and oats and in addition to this Mr. Dorsey has collected considerable material for his study of the cytology of both wheat and oats.

The work is progressing on the construction of the new plant breeding storage house and threshing shed and it is possible that it will be ready for use for the coming harvest.

The various small grain plats in the State were put out in good shape and indications are that some valuable data will be obtained. Quite a quantity of the new oat and barley varieties will be grown this year and a considerable quantity of the Cornellian oat is being increased in Illinois.

I am leaving on June 4 to harvest our wheat at Davis, Calif., and will make some stops enroute. I shall return to Ithaca the last of June and trust it will be possible for some of the men from the Cereal Office to spend some time in Ithaca after I return.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (May 26). Last week good weather prevailed and I was able to seed all of the cultural and increase plats. However, the rain during the last few days has delayed seeding of the fertilizer plats. I hope to start seeding today, but indications are that again it will be interrupted by rain.

(May 30). Yesterday I finished the seeding of rice, with the exception of the plats in the date-of-seeding experiment. Because of the excellent weather, germination has been prompt and satisfactory. All varieties in the nursery increase plats are up to a good stand. We now are busy getting land ready for soy beans and hope to finish this by the end of the week.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (May 18) After a very wet spring season we at last were able to start farm activities during the first half of May.

A small seeding of oats was made on February 22 and another two weeks later in a date-of-seeding experiment. Our main oats seeding, which we usually try to make about the middle of March, was delayed by continuous rains until late in April.

During the first week of May we made some extensive plantings of corn, principally for genetic and improvement investigations. On the whole the weather of the last two weeks has been very favorable to crop growth. Wheat is just beginning to head on the Station field and will be somewhat earlier than usual this year. Oats, of course, will be late on account of very late seeding, and, unless the summer is extremely late, we shall have a very poor crop of oats.

Over the State as a whole the acreage of oats has been much reduced by the long continued spring rains, and it is probable that the acreage will not be more than a third of the average. There has been a great deal of interest in soybeans, principally as a result of the decrease in oats acreage this spring and we expect this to be an important factor in establishing the soybean crop in the State. Corn planting is now well under way all over the State and is practically completed in the southern portion.

(June 1) The latter half of May was generally favorable for crop growth in Missouri although the weather continued rather showery and cool. The wheat crop over the State as a whole is still in good condition and has headed in most sections in the southern half of the State.

The acreage of oats was much reduced by the late spring and the oats which have been sown are far behind the usual stage for this season, though they are doing as well as could be expected considering the time of sowing. Much of the acreage intended for oats will be planted to soybeans this year. Corn planting is practically completed and corn is doing well.

On the Station field we expect to harvest wheat about June 15 to 20. The wheat is in excellent condition. We have a large planting of corn for genetic and improvement work. In the genetic investigations with corn Dr. W. H. Eyster, of the department of botany, is cooperating with us as he did last season.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (May 16)
After several days delay due to continued rains, we resumed planting our cooperative corn experiment May 8 and finished the field May 9. Since then I have assisted the Station men with their varietal experiments on corn and cotton, all this between rains, and yesterday helped Prof. Essary get in his selfed strains of corn. Dr. Sherbakoff's treated and untreated seed for Fusarium studies is yet to be planted, and while the weather has been and still is very unfavorable, we hope to do that this week.

All of our own corn is up and coming on well. Some soil washing has take place but no material damage has resulted. Cultivation will be in order within a few days.

(May 30) Since my last report, dated May 16, we have finished our corn planting. This has included a varietal experiment in which some of our own varieties have a place, a plat of selfed strains of Prof. Essary's, and a test of treated and untreated seed for fusarium control undertaken by Dr. Sherbakoff. The varietal plats of cotton also have been planted.

Our own corn field is up in good shape and has just been cultivated for the first time. The stand is excellent. Dr. Haghty, who has been here a few days inspecting his wheat plots, left for Washington yesterday afternoon.

The barley harvest is well under way and haying has begun.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report)

Iowa State College, Ames (Barberry Eradication, R. H. Porter) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (June 3) I was glad to receive your letter of May 26th. Despite the handicap of rainy weather our experimental work throughout the state is progressing very satisfactorily.

Beginning next Tuesday I am planning to devote the major portion of my time until July 10 to the preparation of my part of the Physical Characters manuscript. During that period I expect to turn over the responsibility for the administration of the work here to my able associate, Mr. Koehler. We hope to have this completed for publication by August 1st.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) (April report) A close watch of the rust situation around the wild barberry area at Gurnee is being made. Harry L. Dixon was placed in charge of the area on May 29. A map of all the farms and fields of grain in that vicinity has been made and it is proposed to make observation of the grains and grasses in that vicinity every few days. The last of May found the bushes all heavily infected with rust in the aecial stage.

A lot of resurvey work was done during the month of May in the region around Chicago.

A number of men were interviewed for barberry eradication work in Illinois commencing July 1 and most of the men have now been engaged.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (Report of John F. Trost) Practically all of the seeding has been done in the experimental plats. I have one small plat remaining to be seeded at Wanatah, Ind. The disease and breeding plats at La Fayette are in good condition, and notes on seedling characters are now being taken.

(Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report.)

Purdue University College of Agriculture, La Fayette (Barberry Eradicatio., K. E. Beeson) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (May report) In the April resurvey for barberry sprouts 302 properties in western Ohio were visited where barberries had previously been removed. In this resurvey 251 sprouts were found in 55 instances.

In May the resurvey for sprouts consisted of the inspection of 26 places in Allen County where barberries had been removed. In this case only two sprouts were found on two properties. All sprouts found to date have been removed. It has been observed that if city people agree to remove their barberries they do a better job of it than the farmers.

The equivalent of one-half of a county was covered in May by an original rural barberry survey. Three towns in this territory were also covered. The city of Lima was one of the three towns surveyed and it took considerable time. Thirty new locations were found in town and two in the country. These locations included 105 barberry bushes. A total of 87 bushes previously reported as found on original survey in Allen County were removed on resurvey.

Plans for the examination of the spore content of the upper atmosphere, by means of areoplanes and traps, at Dayton, were frustrated three times by unfavorable weather conditions. Flights will be made as soon as opportunity permits.

Uredinio spores of P. graminis on wheat were collected on May 6 near West Carrollton, Montgomery County. On May 24 P. graminis, in the uredinial stage on wheat, was collected near Dayton. Stations for the observation of the spread of rust on barberries have been established.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Ready) (No report).

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson)(No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker, for E. C. Stakman).

Teliospore Germination. Telial material stored in an exposed position on the side of a building failed to survive the winter. The first Teliospore germination was obtained the latter part of march. From that time on, various collections germinated more and more abundantly until a maximum was reached early in May. After this it fell off rapidly and, by the first of June, all collections showed only a trace of germination or none at all.

Teliospores were found germinating naturally out-of-doors for the first time this year on April 30. A shower which lasted about three hours occurred on the evening of May 2. The following morning all stages were obtained, from teliospores just beginning to germinate to germinating sporidia.

In one instance teliospores, from material which seemed dry, were found to germinate and produce promycelia two to three times the length of the spores in two and a half hours. Many cases were observed where sporidia had been produced and had germinated within eighteen hours.

Teliospores were found to germinate at temperatures ranging from 5°C to 25°C. No germination occurred at 31°C. Temperature does not seem to be a limiting factor in teliospore germination, since good results were repeatedly observed at temperatures of 5° to 23°C.

Rust Developments. Reports indicate that stem rust appeared on the barberries this spring as follows:

Ohio	April 11	Colorado	May 8
Nebraska	" 21	South Dakota	" 9
Wisconsin	" 29	Michigan	" 15
Minnesota	May 5	North Dakota	" 22
Illinois	" 6		

Wheat growing near barberries was found infected with stem rust in Ohio on May 26. Rust spread from barberry bushes was found on susceptible grasses in Minnesota on May 26 and in North Dakota May 28. Reports from southern States up to June 1 indicate that the rust on grains and grasses away from barberries is probably now no farther north than central Missouri.

Aeciospore Viability. Studies with aeciospores are being conducted in an attempt to determine how long they will retain their viability under different conditions of light, temperature, and humidity. The length of time required for germination and the conditions for best germination are also being investigated. Thus far, results suggest that aeciospores are relatively short-lived and are extremely sensitive to environmental conditions.

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (May report). Several interesting appearances of stem rust were observed during the month of May. Pycnia were found on barberries in two places on May 4, another on May 5, and at several other places since that time. Three rust study stations have been established, one each at Northfield, Stanton, and Shieldsville. The one most suitable for the study is near Northfield, where 175 bushes stand in a strategic position to spread rust to grains and grasses on all sides. Uredinial infection is already in evidence near the bushes. We are now trying to map the progress of the rust at the various stations.

One of the most successful demonstrations of the relation of barberry to stem rust was held May 31 in south Minneapolis, where a group of twenty millers and elevator men were shown actual bushes of common barberry in the field. The quack grass adjacent to the bushes was heavily infected but the grasses farther away were not infected. The men were thoroughly convinced that the barberry is responsible for the spread of stem rust.

During the month 176 bushes were found on two properties in the original survey, and 115 bushes and 439 sprouts and seedlings were destroyed in the resurvey. The weed inspection force starts work June 1. All former plantings of common barberry will be checked for sprouts and seedlings in the surveyed area.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (June 1). Climatic conditions continue to be cool and backward for this time of the year. The third series of date-of-seeding plats were seeded on May 16 and emerged to stands by the 23rd. The fourth series were seeded May 31. On May 17 the kafir rate-of-seeding plats were seeded as also 50 rows of kafir hybrids. All emerged to stands by the 25th. On May 26, 148 rows, consisting of varietal nursery and kafir hybrids of 2nd and 3rd generation material, were seeded head to row. This seed had emerged June 1.

The varietal plats were to be seeded to-day but a shower and threatening weather prevented. They will be seeded at the earliest date possible.

Maximum temperature for the last half of May was 94° on the 21st, minimum 52° on the 16th. The rainfall for the last half of May was 0.67 of an inch, which fell in 4 showers.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report).

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Experiment Farm, Akron (E. A. Coffman) (May 16-31). Weather conditions have been very favorable to cereal crops at Akron during the past half month. A total of nearly 3 inches of moisture was received during the period. As the soil was well supplied with moisture previously the moisture received during the latter half of the month has delayed field work to some extent.

Corn planting was completed at Akron during the latter part of May. A total of more than 500 plats and rows of corn were planted at Akron this season. Some of this corn has started to emerge. Sorgnum planting is now holding the attention of the station force. The sorgnum plantings will very probably be more numerous this season than here-to-fore.

As a whole the prospects for all crops are very bright at the present time in this section. Rye is about 50 percent headed and the early varieties of barley are just starting to emerge from the boot. With an abundance of moisture in the soil it is very probable that all of the cereal crops will have headed before any injury from drought can take place even though we should receive little or no moisture during June.

During the past half month the Akron Field Station has enjoyed visits from Mr. M. N. Pope of the Barley Project of the Office, Professors Robertson and Kidder of the Agronomy Department of the Colorado Agricultural College and Mr. John Kelso of the Ardmore, S. Dak. Station.

Agricultural College, Fort Collins (Barberry Eradication, John R. Fitzsimmons) (No report).

NEBRASKA

College of Agriculture, University Farm, Lincoln (A. F. Thiel) (No report)

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (May 31). During the first part of the month the weather was very favorable for farm operations, but for the last 10 days it has been cold and wet. The moisture was very much needed, however. Corn, sunflowers, and potatoes are being planted and the seed bed for millet is being prepared. The farmers of this region are planting a larger acreage of these crops than ever before. As a result many inquiries are made at the Experiment Farm regarding seed.

The nursery for spring grains is looking fine, and the fields of spring grain are making a good growth. It is very likely that the winter wheat will be disked and the land seeded to millet. This will depend on the showing it makes after the weather clears.

Most of the trees west and north of the farmstead winterkilled. The ash fared much the better. The new plantings of last year came through in good shape, and are in full leaf.

The prairies are in better shape than for a number of years and live stock is making a fair gain.

During May a total precipitation of 1.27 inches was recorded. This fell at three different times in quick succession. There were light showers at other times but none of any consequence.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (May report). The month was spent in making a resurvey of Albany, Platte, Johnson, Niobrara, Converse, and Sheridan Counties. Two sprouts were found in Platte County and three in Sheridan County. One bush was removed from a resurvey property during the month. No rust was found either on grains or barberry bushes.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (May report) May was spent in original survey work since old plantings had not sprouted yet and resurvey work was impossible. Only two men were in the field during this month. Beadle County was completed with a total of five rural plantings. The earliest date of aecidial infection found in South Dakota was May 9. Infection was found on barberries in various places in the wheat-growing section of the State by May 22. There is no uredinial infection on cereals or grasses to date. Considerable newspaper publicity has been done during the past month through the cooperation of the Farm Bureau and the State College.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel (May 31) Mr. A. C. Dillman, agronomist in charge of Flax Investigations, visited the station on May 16.

Owing to frequent rains it has been difficult to make field sowings as planned. Fortunately, some are scheduled for later dates, which has made it possible to make all sowings "on time." Practically all seeding on wilt infected soil has been completed. The plants that have emerged have been count-

ed to determine the degree of wilting in the various experiments. Traces of [illegible] have been observed, and pure cultures of Fusaria have been obtained from the wilted plants. These cultures will be used to inoculate certain field plats at a later date.

The first sowings of the experiments on the control of flax canker have been completed. An instrument shelter is being installed in the plats, which are located near the laboratory, and it is planned to carry out extensive investigations on the relation of temperature and other conditions to canker. It is hoped that some more practical means of controling the disease may be arrived at.

North Dakota Agricultural College, Agricultural College (Barberry Eradication, George C. Mayoue) (May report) Field work during the month of May was hampered to quite an extent by frequent rains. The time spent in the field was devoted entirely to checking for sprouts in Cass, Richland, and Stutsman Counties.

A total of 45 sprouts was found on 14 different properties. Most of these were on properties surveyed in 1918-1919. In this work 25 bushes in towns and 135 bushes in the country that had not been discovered in the original survey, were found. This is not surprising in that these counties were the ones originally surveyed in August and September of 1919, when the farm-to-farm survey was begun and methods for this type of survey were not well worked out.

The first infection (moderate) was found on barberries on a farm in Stutsman County, central North Dakota, May 21, 1922. Last year the first infected barberries were found on June 6. A study of this infection indicated that it possibly had occurred about May 25, 1921. Since May 21 of this year bushes, lightly or moderately infected, have been found in Richland County.

No traces of stem rust were found on the grains. A very slight infection was found on quack grass (Agropyron repens) and slender wheat grass (Agropyron smithii).

All plans for field work to begin July 1 have been made. All the men who are to be field assistants are being schooled daily in a regular one-hour class.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.(May 16-31 The past two weeks have been pleasant and favorable for field work. Crops have made good growth to date, but there is very little surplus moisture in the soil. Winter rye, brome-grass, and other crops which have made much growth are already suffering from drought. Spring-sown small grains are still in good condition, but their yield will depend upon the rainfall of the next 30 days. The precipitation for May amounted to 2.05 inches. The total for the 5 months, January to May inclusive, is 5.06 inches, which is about 1 inch below the 40-year mean for this locality.

For the last half of May the maximum temperature recorded was 81 degrees on May 22, 26, and 27, minimum 36 degrees on May 19.

Seeding of the flax nursery was finished today. Flax in the date-of-seeding and tillage plats is exceptionally fine this year, as there was no frost injury even to the plats sown April 15.

Four varieties of wheat, Kubanka C. I. No. 1440, Marquis, Kota, and Hard Federation are being grown in the water requirement experiment conducted by Mr. Dillman.

Dickinson Substation, Dickinson (Ralph W. Smith) (June 2) Warm weather has prevailed during the past week and crops are in good condition and growing rapidly. Several showers have occurred during the latter half of the month but a good rain is needed. The total precipitation for the month of May was 1.97 inches, most of which fell during the first half of the month.

There is considerable winter rye in this locality all of which is in excellent condition and almost fully headed. Winter rye varieties at the Substation are in good condition. Rosen rye winterkilled more than the other varieties. Winter wheat varieties, drilled in standing cornstalks and protected by a liberal snow covering during the winter appear more promising than in any previous year.

Fifteen varieties of corn were planted in rows 40 rods in length, and about 40 strains were planted in an ear-to-row experiment. The stand of corn has been slightly reduced by cutworms. Vacan hills have been replanted, and poisoned bran was scattered over the field.

The alleys in cereal plats are being cultivated and the plats trimmed.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (May 31) Practically all of the spring seeding has been completed. Two more dates of corn planting and some grass seed are all that remain to be seeded. Oats, barley, spring wheat, and flax were seeded in the varietial plats on April 24, April 25, May 3, and May 8, respectively. The small-grain nursery was sown during the period from May 6 to 15. The corn varieties were planted on May 19. Frequent showers delayed spring seeding a great deal. Everything has emerged except the corn.

Winter wheat is growing rapidly. Some of it in the nursery is eight or more inches high. In some of the tests the winter wheat is too thick.

The straw mulch on the plats seeded with the furrow drill killed or injured the wheat in spots where the straw drifted. The straw drifts, together with the almost continuous covering of snow during the winter, seemed to smother the wheat. Soil conditions under these spots also may have been affected unfavorably for the wheat. This injury is much more common under the furrow-drill method than under the ordinary-drill tests, because the ridges made by the furrow drill hold the straw in places. This year's test again emphasizes the uselessness or disadvantage of the straw mulch for the furrow drill. In other parts of the test the furrow-drill-sown plats are showing more growth and vigor than the corresponding ordinary-drill-sown plats.

The precipitation during the month of May amounted to only 1.57 inches, which is a little less than one-half of average, but nevertheless it was a cool cloudy month, rain having fallen on 17 days during the month. The rainy weather during May has tended to lessen the acreage of spring wheat and increase the acreage of fallow, corn, barley, and oats.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report)

WESTERN BASIN AND COAST AREAS
(North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (May report) Unfavorable weather for crops prevailed during the entire month of May. The total precipitation for the month was only 0.09 of an inch. This is the lowest on record since weather data have been kept in the county during the past 17 years. The normal precipitation for May is 1.09 inches. The greatest amount of precipitation at any time during the past sixty days was 0.12 inch early in April.

The highest temperature for the month was 85° on the 15th and 16th, and the lowest, 29° on the 22nd.

Some winter wheat varieties will begin to head within a week. The straw probably will be very short, and unless we get a good rain soon the yields also probably will be short.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (May report) During May the weather has been very changeable, with temperatures slightly below normal. There has been considerable wind from all directions. The highest temperature was 98 degrees on May 30, the lowest 35 degrees on May 8. The total evaporation was 5.945 inches, and the total rainfall 0.59 of an inch.

A large percentage of the commercial rice acreage, estimated at 135,000 acres, was seeded and irrigated the first time during the first 15 days in May. However, a few growers are still seeding, while others are just completing the first irrigation.

On many foul fields the growers broadcasted the rice and are holding some water on the land continuously, others are broadcasting in the water. By these methods they hope to check the growth of water grasses.

In a broadcast rate-of-seeding experiment at the Station rice was sown in duplicate plats on April 27, May 5, 15, and 25. The plats were submerged immediately after seeding and the water held at four, six, and eight inches deep respectively. The April 27 and May 5 sowings have emerged through the water but the stands are thin. On a few plats the stands are extremely thin because of the development of moss which prevents the young plants from emerging. The Station rice that was drilled, irrigated, and drained has emerged with good stands.

The irrigation water is very cold this spring. Yesterday when the air temperature was 98 degrees the water in our main supply ditch was only 58°. This is due in part to the large amount of snow in the mountains which is melting quite fast and keeps the river high.

Indications are at present that because of the cold water and comparatively cool weather the stands of rice submerged immediately after broadcasting will not be very good.

University Farm, Davis (V. H. Florell) (May report) A good rain about two weeks ago greatly benefited the grain crops and especially the late sowing. Considerable lodging was caused in early-sown rank growing barley and also in weak-strawed varieties of wheat. Both wheat and barley are filling nicely and the indications are that a good crop with plump, well-filled grain will be harvested.

Plat and nursery barleys are ripening rapidly with already quite a number of them fully ripe. Most varieties are more or less badly lodged and the prospects are that harvesting will not be a pleasant task this season. Wheat is ripening up more slowly than the barley. Sunset is practically all ripe, while Bunyip, the Hard Federation and other early varieties have just begun to ripen. In other years at Chico these varieties have been ripe at this date. Quite an infection of barley smut has been observed in a number of the field-plat barleys while very little bunt has been observed in the wheat varieties, with one exception. This is one of the replicated nursery varieties which will be cut out and discarded so as not to infect other varieties.

No stem rust of wheat has been found. Stripe rust of wheat has been observed only on Early Baart and an awned California variety known as Indian.

Varieties of oats are also ripening. Fulghum and a California variety, known as Guyas, are about half ripe and equally early. Burt is considerably later than these but has just begun ripening.

The corn varieties sent out by Mr. Richey were planted on May 15 and have emerged with fairly good stands.

Mr. Roland McKee, Agronomist in the Office of Forage Crop Investigations, visited the Farm on May 17.

Agricultural Experiment Station, Berkeley (W. W. Mackie) (Report by Fred N. Briggs) (May 21) The work here at Davis is progressing very well. Right now I am making some wheat crosses for bunt resistance. The plats look better this year than they have ever before, and I am sure that I will get some good data this year. I am looking forward with a great deal of pleasure to seeing Dr. Tisdale.

C E R E A L C O U R I E R

Official messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 14 June 20, 1922 No. 13
Personnel (June 11-20) and Field Station (June 1-15) Issue.

PERSONNEL ITEMS

Alvin A. Anderson, C. George Anderson, and Charles Auburg have been appointed field assistants, effective July 1, 1922, to assist in barberry eradication in Minnesota, Minn.

Miss Helen W. Barrett was appointed June 16 as clerk, stenographer and typewriter, to assist the State leader in barberry eradication at St. Paul, Minn.

Jefferson S. Benner, Melana C. Bevan and Harold E. Diesi have been appointed field assistants, effective July 1, 1922, to assist in barberry eradication with headquarters at St. Paul, Minn.

Helmer Bonde was appointed June 5 as field assistant in barberry eradication with headquarters at Minneapolis, Minn.

Ian A. Briggs has been appointed unskilled laborer, effective July 1, 1922 to assist in field work at the Judith Basin Substation, Moccasin, Mont.

J. C. Brinsmade, Jr., assistant agronomist at the Northern Great Plains Field Station, Mandan, N. Dak., stopped in Washington on June 20 en route from Washington, Conn., where he spent a few days with his family. He consulted with members of the Office staff concerning proposed bulletins on inheritance studies in flax.

A. C. Dillman writes from Mandan, N. Dak., on June 9: "Mr. Brinsmade left here last evening for his home at Washington, Conn. I think he plans to return by way of Washington, D. C., about June 15. **** I am glad to report that a rainfall totaling 1.36 inch was recorded on June 7, 8 and 9. This will save the crops for a week or 10 days and by that time we shall hope for more. I attended the Irrigation Congress at Bismarck yesterday. The congress produced a flood of resolutions covering every possible type of irrigation scheme from a dirt dam in a dry run to the damming of the mighty Missouri."

Hurley Fellows was appointed field assistant, effective June 5, to assist in laboratory investigations with take-all disease of wheat at Madison, Wis.

John R. Fitzsimmons, recently reappointed State leader of barberry eradication in Colorado, reported in Washington June 16 for a conference with Office officials. He has been helping Dr. Kempton in arranging the campaign to begin July 1. He will leave today to take up his duties at his headquarters at Fort Collins.

Franklin E. Fobes has been given an appointment as field assistant in barberry eradication, effective July 1, 1922, with headquarters at St. Paul, Minn.

Miss Mary A. Hopkins has been appointed clerk, stenographer and typewriter effective June 16, 1922, to take the place of Miss Tryphosa E. Small as clerical assistant to Gordon C. Curran, State leader of barberry eradication, at Urbana, Ill.

Dr. H. B. Humphrey, pathologist in charge of cereal disease investigations left Washington on June 11 to visit the area infested with flag smut in Madison and St. Clair Counties, Illinois, in order to study the progress of the survey and to check up on the identification of the different smuts occurring in the area. He attended a conference with officials of Illinois and Missouri and of the Federal Horticultural Board on June 19, at East St. Louis, Ill. He is now visiting points in Illinois, Indiana, Iowa, Wisconsin, Minnesota, and South Dakota to discuss cooperative cereal disease experiments with representatives of this Office and cooperators in the various States.

Dr. A. G. Johnson, pathologist in cereal disease investigations, left Washington on June 17 to attend a conference on June 19 with Illinois and Missouri officials and officers of the Federal Horticultural Board on the recent developments of the flag smut situation in Madison and St. Clair Counties, Ill., and Saint Louis County, Mo. Before his return to Washington, about June 23, he will inspect the corn rot experiments in Illinois, and confer with pathologists of State agricultural experiment stations in Illinois and Indiana, concerning these and other diseases of cereals.

Curtis H. Kyle, agronomist in charge of corn investigations in the Southern States, will leave Washington June 27 to confer with officials of the Tennessee Agricultural Experiment Station at Knoxville, Tenn., concerning plans for future cooperative experiments with corn. Together with Fred D. Richey, agronomist in charge of corn-breeding and cultural investigations, he will study the extensive corn breeding experiments being conducted at Knoxville this year under the immediate supervision of L. S. Mayer, assistant agronomist. Mr. Kyle also will take notes on the breeding rows and crosses of U. S. Selection No. 201.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, left Washington on June 17 to attend a conference on June 19 of Illinois and Missouri officials with officers of the Federal Horticultural Board on the recent developments in the flag smut situation in Madison and St. Clair Counties, Ill., and Saint Louis Co., Mo.

John H. Martin, agronomist in western wheat investigations, writes as follows from Dickinson, N. Dak., under date of June 7: "The counting of stands in the winter-wheat nursery has been completed. Very few plants survived on fallowed land, but some of the rows sown in stubble show more than 50 per cent survival. Instead of leaving Dickinson on the 10th instant I plan to remain here until about the 14th in order to make some hybrids. Winter wheat in the plats on corn ground is nearly ready to head. Spring wheat is looking well in the vicinity of Dickinson, although rather later than usual. Because of the limited precipitation the wheat plants are not so vigorous as they are from the Missouri River eastward. More rain is needed here now. Apparently a normal acreage of wheat has been sown in this section.

Malcolm B. Melroy was appointed field assistant, effective June 12, to assist in the cereal disease investigations conducted at Arlington Farm, Va., under the direction of Victor F. Tapke. He succeeds William P. Walker, who has been transferred to the Office of Fruit Disease Investigations.

John O. Olson has been appointed field assistant, effective July 1, 1922, to assist in barberry eradication in Nebraska.

Merritt N. Pope writes from Davis, Calif., on June 11, that he found the barley ready for harvest and that the first 540 rows have been harvested.

R. H. Porter, formerly State leader in barberry eradication in Iowa, was an Office visitor on June 16 and 17, while on a vacation trip. While here he discussed with Dr. Kempton future plans for barberry eradication and the subject of turning over his work to the new leader, J. H. Muncie on July 1. Mr. Porter becomes full-time extension pathologist for the State of Iowa on that date, as well as collaborator with this Office, and will still be intimately connected with the barberry eradication campaign.

David W. Purdy has been appointed field assistant in barberry eradication, effective July 1, with headquarters at St. Paul, Minn.

Fred D. Richey, agronomist in charge of corn-breeding and cultural investigations, will leave Washington on July 27, in company with Curtis H. Kyle, agronomist in corn investigations, to confer with officials of the Tennessee Agricultural Experiment Station concerning plans for future cooperative experiments with corn. He will also study the extensive corn breeding experiments being conducted there this year under the immediate supervision of L. S. Mayer, assistant agronomist. Mr. Richey will remain for some time to assist in note-taking and hand pollination.

Percy Roncoaun has been given an appointment as field assistant, effective July 1, 1922, to assist in barberry eradication, with headquarters at Lincoln, Nebraska.

Loyal L. Rulla, Hayburn W. Samson and Forrest J. Scrivner have been appointed field assistants, effective July 1, 1922, to assist in barberry eradication in Nebraska.

James L. Seal was appointed on June 5 to assist in barberry eradication, with headquarters at St. Paul, Minn.

Willard J. Simpson, Clarence Slonson, Eaton M. Summers, Claude V. Thurber, and E. C. Tullis have been given appointments as field assistants to assist in barberry eradication in Nebraska, effective July 1, 1922.

Jerry A. Vacha has been appointed field assistant, effective July 1, 1922, to assist in barberry eradication, with headquarters at St. Paul, Minn.

Walter E. Youngdale has been appointed field assistant in barberry eradication in Minnesota, effective July 1, 1922.

VISITORS

A. J. Surratt, agricultural statistician of the Bureau of Markets and Crop Estimates in Illinois, with headquarters at Springfield, called at the Office of Cereal Investigations on June 8. He was in Washington as a member of the Crop Reporting Board, which issued the June crop report on that day.

L. M. Jeffers, formerly with the Division of Grain Investigations of the Bureau of Markets, and now in charge of the enforcement of the California Grain Standards Act, under the State Department of Agriculture, was an Office Visitor on June 20. Mr. Jeffers was formerly in charge of the Portland(Oregon)Grain Laboratory of this Department, and more recently in commerical employ.

MANUSCRIPTS AND PUBLICATIONS

Galley proof of the Corn Section of the Yearbook of the U. S. Dept. of Agriculture for 1921 was read during the week ending June 17.

Galley proof of the Wheat Section of the Yearbook of the U. S. Dept. of Agriculture for 1921 entitled "Wheat Production and Marketing," was read on June 20. Engraver's proofs of the illustrations also were approved on that date.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly) (No report).

VIRGINIA

Arlington Farm, Rosslyn (Cereal Project, J. W. Taylor) (June 14) Harvesting operations have been in progress for the past week, and, with the continuation of favorable weather, will extend to approximately June 20. The wheat ripened exceptionally fast on June 10 and 11, the glumes appearing to color overnight. Heavy rains and strong winds shortly after the flowering period of wheat caused considerable lodging in some of the plats, making harvesting difficult. The late-maturing oats were slightly lodged by the storm on the evening of June 11.

Leaf rust on wheat was severe, as usual. The epidemic was later than last year, but, nevertheless, there is no doubt that it hastened maturity. Dr. E. B. Mains, of La Fayette, Ind., and Dr. Leighty spent several days at Arlington obtaining leaf-rust data on varieties and hybrids grown in the extensive wheat nurseries. They report finding one plant which showed infection from stem rust.

The annual war against sparrows is now on. Poisoned grain, netting, and an automatic gun are all being used. Covering the plants with netting, or bagging individual plants now seem to be the safest methods.

(Corn Project, H. S. Garrison) (June 15)

Practically all of the corn was planted by the 15th. Seasonal conditions so far have been favorable. All the corn is growing rapidly and most of the earlier planted plats have been thinned.

Considerable "bud-worm" damage is noticeable, especially in the upland plats. This year there has been considerably less damage than usual from birds and rats.

Chlorophyll deficiencies, such as spottings and stripings, including "japonica", already are appearing in the inbred strains, and some plants on which they were most pronounced have died.

NEW YORK

Cornell University Experiment Station, Ithaca (E. M. Love) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (June 16) The seeding of soybeans was finished June 5. On the following day heavy rains commenced and continued through the 9th. This resulted in the quick germination of beans. So far this week, the weather has been clear and warm, the maximum temperature ranging from 94 to 97 degrees.

All rices are up to a good stand and irrigation was commenced last week. We are irrigating fertilizer plats today. The warm weather of the past winter and spring has caused a heavy growth of grass, especially "bull grass," on the levees. We are having this removed and the general appearance of the station is thereby being improved.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (June 15) During the first half of June the weather in the State as a whole was favorable to crop growth. During the last week we have had a good deal of hot, dry weather, and our wheat on the Station field will be ready to cut early next week. The early varieties of oats are now in full heading, in spite of the extremely late seeding of this season. A small seeding of oats made February 22, and another made two weeks later, are almost mature.

Over the State as a whole corn is reported to be making very good progress and the wheat harvest has begun in the southern section.

The first annual Farmers' Field Days of the Experiment Station will be held next week, June 21, 22, and 23. The object of these field days is to supplement the annual Farmers' Week held in the winter and to permit the departments conducting field work to demonstrate their experiments under the most favorable conditions. A large attendance of farmers from all parts of the State is expected.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (June 16) Since my last report we have harvested Dr. Leighty's and Dr. Main's wheats and prepared them for shipment to headquarters. We have also thinned the corn experiment plat. A very heavy wind and rain storm the night of June 13 laid the corn low and caused considerable soil washing, so that it was necessary to straighten the corn plants in the breeding blocks and the washed places throughout the field. The continued rains have interfered somewhat with cultivation.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report).

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (June 16) Field work is progressing very satisfactorily.

Mr. Koehler is taking notes on stand and early vigor of plantings in the inoculation experiments and breeding plats. Beginning on Monday he expects to make observations for wheat scab in the winter-wheat nursery and also in the scab-resistant seedings, some of which are very promising both from the standpoint of scab resistance and agronomic value.

Mr. Reddy started his extensive inoculation studies yesterday.

Mr. L. E. Compton, who is assisting Dr. Mains with the leaf-rust investigations, recently spent three days at Bloomington taking leaf-rust notes on wheat.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report).

(Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report).

Purdue University College of Agriculture, La Fayette (Barberry Eradication, K. E. Beeson) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (June 17). We are convinced that a resurvey of every barberry location found in the original farm-to-farm survey is absolutely necessary. While the eradication has been done either by the Field Assistants or under their supervision in cultivated areas, sprouts seldom appear. This was shown in Monroe County, which had no escaped areas. Every planting in the County was revisited during the month of May and not a sprout was found.

The State Department of Agriculture is cooperating in the resurvey by furnishing a Deputy Inspector of Nurseries and orchards and an automobile. The resurvey of Monroe County without finding any sprouts made it difficult to convince the State Department that a resurvey was necessary. Two days work in Lenawee County, which contained escaped areas, convinced everyone that the resurvey was of prime importance and the State now promises its fullest cooperation.

On the Bradish Farm, near Madison Center, are two woodlots, each containing about 10 acres. These woodlots are one-half mile apart and the farm home is between them. A purple bush over 70 years old was found at the farm home and was removed two years ago. Mr. Bradish spent two weeks with a team pulling bushes from these areas and Field Assistants felt confident they had gotten all the seedlings. When these areas were visited during the month of May there were found vast numbers of seedlings and enough sprouts to discourage any "barbarian". Every bush of any size was heavily infected, and if the weather had continued favorable for rust development a wide spread epidemic might have been expected. Such areas as these will need to be visited for several seasons before one can have the feeling that rust will not appear.

Several photographs were taken of bushes under trees which had served as roosting places for birds.

We were fortunate in having 67 applicants for field work this summer. This gave us a good opportunity for sifting and we feel that we should have a capable squad this season. We expect to use six men to a county with an experienced man as squad leader.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (June 15) There has been practically no rain to date this month. This condition, together with rather warm weather, has caused the sorghums to make rapid growth during the last week and has ripened wheat rapidly. While there was an excess of moisture earlier in the season, a rain will be welcome at any time now.

With the exception of some date-of-seeding plats, which will be seeded July 1st and 15th, the seeding of experimental sorghum and broomcorn is completed. On June 5 broomcorn was seeded in varietal, nursery, and rate-of-seeding plats and emerged to good stands by the 12th. On June 10, milo was seeded in the rate-of-seeding plats and emerged to good stand by the 14th. Thinning is being done in the earlier date-of-seeding plats and in the rate-of-seeding plats of kafir.

Row crops are making rapid growth at present, but rain will be required soon.

Maximum temperature for this month to date 95° June 10; minimum 53° June 4. Precipitation for month to date 0.06 of an inch, June 1.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (June 16) Prof. H. E. Call has three very fine looking fields of Kanota oats at the Agronomy farm and the oat plats are fully headed. Harvesting of the fields and plats will probably commence about the last week in June or possibly a few days earlier. Oats in the nursery are considerably later due to late seeding on account of wet weather. Unless we have an unusually dry hot June, I hope to get seed of most of the strains grown but the yields will probably not be normal or representative

Hays Branch Experiment Station, Hays (A. F. Swanson) (June 16) The total rainfall from June 1 to June 16 amounted to 0.75 of an inch, which is considerably below normal. Fortunately the rainfall for May was up to normal and that of April about twice that of normal.

Wheat has made a wonderful recovery during the last ten days. Most of the spring-sprouted winter wheat was fully headed between June 10 and 12. The rapid growth up to this time has put it ahead of the weeds. Many fields which gave little promise three weeks ago have developed into good prospects. However, since the normal heading time is fully two weeks late and the surplus moisture pretty well exhausted, we will need several more rains to be assured of a crop.

Hot dry weather began June 13 and continued until the 16th, when 0.57 of an inch of rain was recorded. Barley was just passing through the critical period at this time and was rather severely injured. Mariout, Blackhull, and California Mariout were early enough to escape some of the damage, being now in the hard dough stage. The early oats like Burt X Sixty-Day is somewhat injured. Should we fail to get more rain soon this variety will escape further injury. With good rains soon the later-maturing varieties probably will prove to be the best yielders. California Mariout barley has one objection in that it grows too short in this section to be readily harvested.

In company with Mr. R. E. Getty and Mr. A. L. Hallsted of the station the writer visited the region 150 miles southwest of Hays. A number of fields of wheat were found in limited areas that gave promise of good yields. In other areas the prospects are poor. A number of fields have been fallowed for next year's crop. In one of the cooperative barley tests, Mariout barley seemed to be earlier than Coast, Stavropol, and the local strain used as a check. As far as the writer was able to observe Stavropol barley seems to be identical with the local strain grown generally over this section of Kansas.

The fallow experimental ground for wheat was plowed early in June and is in excellent condition .

All of the sorghums have been cultivated once and the corn has been cultivated twice. These crops are now making good growth. The sorghums were set back, however, by an infestation of green bugs. The kafirs appeared to be the more susceptible to the injury. Practically all of the sorghums have now been thinned to a uniform stand.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (June 1-16) Weather conditions during the past half month have been very favorable to growing crops and the indications now are that record yields of the small grains will be harvested. Frequent local showers have kept the growing crops well supplied with moisture and apparently a maximum of tillering and heading is resulting. With the exception of a few days when the thermometer registered around 95° the temperatures have been mild and pleasant.

Winter rye is in full bloom and winter wheat is nearly half headed. The early varieties of barley and oats are fully headed and spring wheat is nearly fully headed. Many of the barley hybrids sown in the screened shelter have headed. Most of these hybrids headed earlier than did Blackhull, our earliest maturing barley at Akron.

All of the corn in our various corn experiments is growing well. Some 500 plats and rows of corn were planted at Akron this season. The corn has all been cultivated once during the past half-month.

Seeding of the sorghum experiments was completed early in the month. Over 100 experimental seedings of sorghum were made at Akron this season. Most of the sorghums have emerged to satisfactory stands and the plants are benefiting by the favorable climatic conditions.

The annual picnic at the Experiment Farm is scheduled for June 24. Judging from past picnics several thousand people probably will visit the Farm on that date.

Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons) (June 16) We are glad to report that very little rust has been found in the field. One field man has been working in northern and eastern Colorado for the last month and has found only one case of rust on common barberry. This was found on sprouts from bushes dug two years ago near Denver University. It is encouraging to know that the number of infections is less this year than it was last year at this date.

It is our plan to keep in close touch with the farmers of eastern Colorado during the summer in order to determine the first sign of rust, which, in previous years, has been attributed to infections from areas east of Colorado.

Our field force is to be increased to three men the first of July and we have hopes of rechecking the entire area already covered and to make a considerable original survey in eastern and southeastern Colorado.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication A. F. Thiel) (No report).

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report).

Northern Great Plains Field Station, Mandan (A. C. Dillman for J. C. Grinsmade, Jr.) (June 16) The small-grain crops were in a very critical condition during the first few days of June. The soil moisture was nearly exhausted and the weather was hot. Maximum temperatures of 94, 96, and 90° were reached on June 4, 5, and 6, the temperatures of June 4 and 5 being the highest recorded at this Station at that date. Fortunately, favorable weather conditions have prevailed since June 6. A rainfall of 1.07 inches was recorded from the period from June 7 to 10 inclusive and 1.90 inches on June 15 and 16, making a total of 2.97 inches for the first half of June. Present crop prospects are excellent, although maximum yields are hardly possible because of the injury from drought during the first few days of June.

Flax sown in the nurseries during the latter part of May did not emerge completely until June 12 to 14, following the rainy period of the previous week. Some injury to the stands of flax has been done by cutworms. Flax sown April 15 is in full bloom. Barley and early varieties of oats are heading.

Six varieties of flax were planted on June 3 in the water-requirement experiment. Each variety is grown in a set of five pots, large galvanized-iron cans of about 110 kilos of soil capacity, according to the method described by Briggs and Shantz. The following crops and plants are being grown in this experiment this season: Wheat,-Kubanka, Marquis, Kota, and Hard Federation; flax,-Damont C. I. No. 3, Reserve C. I. No. 19, Lethbridge Golden C. I. No. 23, Minn. 175-1 C. I. No. 179, N.D.R.114 C. I. No.13, and Primost C. I. No. 12; alfalfa, and four common weeds, namely, Russian thistle, Amaranthus retroflexus, Chenopodium album, and Panicum capillare.

Weeds, especially the Russian thistle, are certainly the chief hindrance to the production of flax in this area. A thick unhindered growth of Russian thistle was clipped close to the soil surface, in areas of 1/5000 of an acre on June 14. The calculated green weight per acre was 16,500 pounds and the oven-dried weight 2,150 pounds per acre, or 13 per cent of the green weight. The water requirement of Russian thistle, as determined by the writer at this Station in 1919, was 237. On this basis the above-mentioned growth of thistles had used 2.24 inches (surface depth) of water.

Dickinson Substation, Dickinson (Ralph W. Smith) (June 15) The first few days of June were hot and dry and hot winds occurred on June 4 and 5 with a maximum temperature of 92 degrees. The drought was broken by rains June 7, 8, and 9, totaling 2.14 inches, followed by still, cloudy weather with very little evaporation. Rain fell again today. It rained continuously from about 4 a.m. till after 6 p.m., a total of 3.89 inches having fallen at 6 p.m. This rainfall was greater than has fallen in one day at this place for many years. The total rainfall for the first half of June was slightly more than 6 inches, which is greater than the normal rainfall for May and June. There was comparatively little runoff during any of these rains and they will be of untold benefit to crops in this section of the state. Many parts of the state had good rains during last week and the rain occurring today doubtless was quite general.

All cereal crops are in good condition at the Substation and among farmers where the land was properly prepared for seeding. Considerable grain was stubbled in and in most cases is very weedy. Winter rye was fully headed several days ago and in excellent condition. Winter wheat is heading.

Cutworms have done some damage to corn at the Substation and to corn and small grain in this vicinity. Mr. C. F. Ainslie of the Bureau of Entomology, is studying the cutworms in this part of the state and reports severe damage from those pests in Golden Valley County and other counties in the western part of the state.

Cereal plats and nursery have been trimmed and alleys and nursery rows cultivated.

Mr. J. H. Martin arrived at the station June 4 and has taken notes on the winter survival of winter-wheat hybrids in the nursery and is making crosses with winter-wheat varieties.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (June 14). The precipitation for the first half of June was 3.32 inches. Most of this fell last week, June 4 to 11. Since the rain we have had several warm days and all crops have made a wonderful growth. Winter wheat is entering the 'booting' stage. Winter rye has already headed.

Winter and spring grain are in very fine condition. I doubt if I have ever seen winter grain appear more vigorous. Spring grain has not grown so much as the winter grain because of late seeding and cool weather. However, all crops have an unusually fine appearance. Weeds are abundant and are making a rapid growth, particularly the mustards.

The greater part of the first half of June was spent in weeding and rogueing the winter-wheat plats and nurseries, and also in cleaning roadways and alleys. Summer fallowing has been started during the last few days.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report).

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report).

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report).

Agricultural Experiment Station, Berkeley (W. W. Mackie) (No report)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

June 30, 1922.
Vol. 14 Personnel (June 21-30) and Project Issue. No.14

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PERSONNEL ITEMS

The temporary appointment of Dr. Sophia H. Eckerson, plant microchemist, who has been assisting in cooperative studies on the resistance and susceptibility of wheat and corn to the wheat scab fungus, at Madison, Wis., was terminated June 30, 1922.

Miss Lola J. Graham has been appointed clerk, effective June 23, 1922, to assist in the clerical work in connection with cooperative cereal experiments at the Kansas Agricultural Experiment Station. Miss Graham succeeds Miss Olive F. Tenney, who resigned her position June 6, 1922.

Dr. A. G. Johnson, pathologist in cereal disease investigations, who attended a conference on June 19 and 20 with State officials of Illinois and Missouri and officers of the Federal Horticultural Board concerning the flag-smut situation in Madison and St. Clair Counties, Ill., and St. Louis County, Mo., returned to Washington June 24. En route to Washington Dr. Johnson inspected the cooperative experiments with corn rot at Bloomington, Ill., and La Fayette, Ind.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, returned to Washington June 26 after attending a conference June 19 and 20 with State officials in Illinois and Missouri and officers of the Federal Horticultural Board concerning the flag-smut situation in certain counties of the two States. Before returning to Washington Dr. Leighty went to Lawrence County, Ill., to harvest wheat selections.

A second letter has been received from Dr. E. C. Stakman, written at Barcelona, Spain, June 10. This letter appears elsewhere in this issue of the Courier.

T. R. Stanton, agronomist in oat investigations, will leave July 1 to study cooperative investigations with oats at agricultural experiment stations in Missouri, Kansas, Colorado, Nebraska, Iowa, Minnesota, North Dakota, Montana, Washington, Idaho, and Oregon. He will spend considerable time in the breeding and identification nurseries maintained at Ames, Ia., Dickinson, N. Dak., and Aberdeen, Idaho. He will also investigate farm practice in methods of harvesting and handling the oat crop in the principal oat-producing States. Mr. Stanton probably will return to Washington about August 31.

F. H. Tarnstrom has been appointed unskilled laborer, effective June 16, to assist in the cooperative experiments with cereal production and cereal disease at the Kansas Agricultural Experiment Station. He succeeds Burton B. Bayles, who resigned from the Service June 6, 1922.

The appointment of Leo R. Tehon, collaborator in the barberry eradication in Illinois, was terminated June 30, 1922.

C. W. Warburton, agronomist in charge of cereal agronomy investigations, will leave Washington July 5 to inspect cooperative experiments with cereals and confer with officials of State agricultural experiment Stations in Minnesota, North Dakota, Montana, Idaho, Washington, Oregon, California, Utah, Wyoming, Colorado, Kansas, and Oklahoma. Mr. Warburton expects to return to Washington, D. C., about August 31.

Roy A. Weaver has been appointed junior analyst, effective June 16, to assist in the cooperative corn-disease investigations at Purdue University Agricultural Experiment Station, La Fayette, Ind., under the direction of Dr. G. N. Hoffer.

Miss Florence S. Willey, pathologist in the investigations with crown rust of oats, with headquarters at Ames, Ia., was married June 21, 1922, to Mr. William P. Nichols, of Ames, Ia. Mrs. Nichols will continue her work with this Office until August 31 in order to complete her line of investigation.

VISITORS

W. W. Burr, formerly connected with the Office of Dry-Land Agriculture of the Bureau of Plant Industry, and now chairman of the department of agronomy, and assistant director of the Nebraska Agricultural Experiment Station, consulted with Office officials June 24. Mr. Burr made the trip from Lincoln, Nebr., to Washington by automobile.

Morton O. Cooper, of Nashville, Tenn., formerly of the Office of Farm Management of this Department, visited the Office on June 23.

A. M. Ludolf, who has been a student at the Kansas State Agricultural College during the past year, was an Office visitor June 14. Mr. Ludolf is now en route to his home in Brazil, where he expects to engage in agricultural experimentation for the Brazilian Government. While in this city he arranged to obtain samples of a number of varieties of cereals for experimental purposes in southern Brazil.

MANUSCRIPTS AND PUBLICATIONS

A paper entitled "Spores in the Upper Air," by Elvin C. Stakman, Agent, Office of Cereal Investigations, and Plant Pathologist, Agricultural Experiment Station, University of Minnesota; Arthur W. Henry, formerly Field Assistant in Cereal Investigations; Gordon C. Curran, Field Assistant in Cereal Investigations, and Warren N. Christopher, Field Assistant in Cereal Investigations, was transmitted on June 30 with a view to publication in the Journal of Agricultural Research.

Galley proof was read June 24 of Farmers' Bulletins 1280 and 1281, entitled "The Hard Red Winter Wheats," and "The Hard Red Spring Wheats," by J. Allen Clark and John H. Martin.

Press proofs have been received of the 60 plates to be included in Department Bulletin 1074, entitled "Classification of American Wheat Varieties," by J. Allen Clark, John H. Martin, and Carleton R. Ball.

Iowa Agricultural Experiment Station Research Bulletin No. 72, entitled "Alternate Hosts and Biologic Specialization of Crown Rust in America," by I. E. Melhus, S. M. Dietz, and Florence S. Hilley, was received here June 21, 1922. This publication is a joint contribution from the Iowa Agricultural Experiment Station and the Office of Cereal Investigations.

Bulletin 190, of the Oregon Agricultural Experiment Station, by D. E. Stephens and G. R. Hyslop, entitled "Wheat Growing after Fallow in eastern Oregon," was received here June 26, 1922. This Bulletin is a joint contribution from the Oregon Agricultural Experiment Station and the Office of Cereal Investigations.

MEMORANDUM TO THE STAFF OF CEREAL INVESTIGATIONS.

June 19, 1922.

In view of the fact that names of the scientific staff are no longer printed on any of the letterheads of the Department of Agriculture, I believe it will be an appreciated courtesy to our correspondents if the names of all signatories to letters prepared in this Office be typed just above the title and below the space reserved for the actual signature.

This action not only will insure that our names are easily and correctly interpreted by our correspondents, but may encourage some of them to adopt the same practice and thus save us considerable difficulty and embarrassment.

I would suggest, therefore, that unless some member of the staff sees specific objection to this practice it be put in operation throughout the Office on and after this date. This applies to the field staff as well as to the Washington staff.

(Signed) C. R. Ball,

Cerealist in Charge.

LETTER FROM DR. E. C. STAKMAN

Barcelona, Spain, June 10, 1922.

So far I have found no stem rust in the principal wheat-growing regions of France or Spain. I looked over the fields in the general region around Paris very thoroughly - no stem rust on wheat, oats, barley or rye. As I wrote you previously barberry rust was just starting at Grignon on May 25. From Paris I went to Montauban - in the best wheat-growing region of Southern France - in the Valley of the Rarn and Garonne. Here Prévost did his work with copper sulfate as a preventive of bunt. With Prof. Bochala I took a long trip through the entire region, but found no stem rust. Then I went south of Bayonne in the Basque country where there also is a great deal of wheat, but again no stem rust. Barberry was not rusted either. Then went to Madrid and consulted with Dr. Fragoso about conditions in Spain. He told me that barberries are common in the mountains in several parts of Spain; they rust and cause rust on grain, so that even in Spain B. vulgaris and B. hispanica (indigenous) are responsible for causing the early development of rust on grains. There is another species in Spain, B. aethnensis which does not seem to rust. I examined many Mahonias in Madrid, - but no rust. The regions where most of the barberry occurs in Spain are rather far, Granada for one, and I didn't think time and money would permit a long trip. Fragoso told me there also were some at Saragossa and I stopped there, but found no barberry, either cultivated or native. Neither have I found any here. It has rained all day, but I went out this P. M. - found no bushes - no rust. Expect to go from here to Briançon, France where there are said to be many wild bushes. According to Patouillard, the same thing is true on the eastern slope of the Jura Mountains, and I hope to go there also if possible.

Stripe rust was well started on wheat in Northern France and a little P. triticina was starting. In Southern France, on the other hand, P. triticina seemed to be more prevalent - and the same is true in Spain. At Zaragoza (Saragossa) P. triticina was well developed, but P. glumarum was inconspicuous. This may have been due to the fact that the wheat seemed to be resistant to P. glumarum, but not to P. Triticina (See specimens Nos. 46 and 47.) Note the hypersensitiveness of the leaves - long necrotic lesions and poor development of uredinia.

Considerable work is being done on selection and breeding wheats. Prof. Ducomel of the National School for Agriculture at Grignon and Prof. Schribaux of the Institute Agronomique at Paris both are doing quite a little. Prof. Schribaux' experimental fields are at Maisy le Roi, near Paris, and Prof. Ducomel's mostly at Mormant. The following varieties seemed to be resistant: Wilhelmine (semi resistant); Carlotta (Strampelli) resistant in Italy, not in France; Hybride de la Paix (Vilmorin's production); Teverson, Chiddam and a hybrid, Rieti x Japhet. If these wheats are not in the United States some can be procured from Prof. Ducomel. Please write me regarding it. Prof. Bochala at Montauban also had a very fine wheat selection of which seed may be obtained after harvest. According to Bochala it seems to be resistant to rusts at Montauban.

Aside from rusts, pietin (Leptosphaeria) has been most interesting. Apparently it does considerable damage. I have sent some specimens. One thing which was especially striking about it was the way in which it caused full-grown wheat to lodge. (See specimens sent from Montauban.) Inversable seems to be resistant while Bon Fermier, a commonly grown variety, seems to be quite susceptible.

With kind regards to everyone,

Sincerely,

(Signed) E. C. Stakman.

Note: In the June 10 issue of the Courier an error was made in giving the probable date of Mr. Ricker's departure from Washington as July 2. As a matter of fact he left June 29.

PROJECT REPORTS

218 B. RUST INVESTIGATIONS
(Dr. H. B. Humphrey, Pathologist in Charge)

Barberry Eradication.- Dr. F. E. Kempton, Pathologist in Charge.

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The barberry eradication project is being conducted in 15 of the North-Central grain-growing States. The cooperating agencies are: States Relations Service, U. S. Department of Agriculture, the extension divisions and experiment stations of the colleges of agriculture, the State and County farm bureaus, the State departments of agriculture, or other law enforcement agencies of these States, and the Conference for the Prevention of Grain Rust.

The annual appropriation since July 1, 1918, has been about $150,000. An increased appropriation, amounting to $350,000, will be available for the fiscal year beginning July 1, 1922.

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ORGANIZATION AND PERSONNEL
July 1, 1922.

Administrative

Washington, D. C. Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture. Pathologist in charge, Dr. F. E. Kempton; stenographers and clerks, Myrtis V. Hall and Grace Roskelly.

Field Operations.

Publicity. Cartoonist and illustrator (part-time), G. D. George; assistant in office of Conference for the Prevention of Grain Rust, Donald G. Fletcher.

Investigations. Studies of factors affecting distribution of common barberry bushes and investigation of methods for their eradication, - botanist in charge, Dr. W. W. Robbins.

Epidemiology studies,- collaborating agent, Dr. L. C. Stakman; collaborating pathologist, Dr. E. M. Freeman; field assistants:

Bonde, Reiner	Christensen, Jonas J.	Ostrom, Emil E.
Butler, Wallace	Lambert, Edmund B.	Seal, James L.

Survey, Assistant pathologist, aiding in the direction of field operations.

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Colorado: Department of Botany, Agricultural College, Ft. Collins. State leader, John R. Fitzsimmons; cooperating agent, Roud McCann, Director of Extension; collaborating pathologist, C. D. Learn; State law-enforcement field agent, Dr. C. P. Gillette, State Entomologist; stenographer-clerk, furnished by the State; field assistants: Ernest A. Lungren and Bruce J. Thornton.

Illinois: Post Office Building, Urbana. State leader, Gordon C. Curran; cooperating agent, W. F. Handschin, Assistant Director of Extension; collaborating pathologists, Dr. Geo. H. Dungan and Dr. H. W. Anderson; State law-enforcement agent, P. A. Glenn, Chief Inspector, State Department of Agriculture; stenographer-clerk, Mary A. Hopkins; field assistants:

Anderson, Floyd G.	Hart, Siegfried P.	Reid, Clifford F.
Ashbaugh, Walter W.	Honey, Edwin E.	Roll, Ray H.
Cornwell, Earl D.	Huxel, Charles J.	Sanders, Paul T.
Dixon, Harry L.	McCarty, Mark A.	Snively, Hubert K.
Griffin, Edwin D.	Moyer, Andrew J.	Twardock, James A.
Guba, Emil F.	Neville, Harry C.	Weedon, Amy G.
Hanly, Darrell I.	Ostrom, Carl J.	

Indiana: Botany Department, Purdue University Agricultural Experiment Station, La Fayette. State leader, Keller E. Beeson; cooperating agent, G. I. Christie, Director of Extension; collaborating pathologists, Dr. H. S. Jackson and Dr. E. B. Mains; State law-enforcement agent, Frank N. Wallace, State Entomologist, Indianapolis; stenographer-clerk, Josephine M. Walaron; field assistants:

Burlage, Henry M.	McKenzie, Glenn H.	Parker, Omley
Castell, Stanley	Marshall Reuben C.	Ridenaur, William W.
Heine, Albert W.	Menefee, R. E.	Rougers, Ralph H.
Kelsey, Ray T.	Miller, Chas. H.	Wegel, Harold J.
McCally, Ross L.	Miller, Leo D.	
McCrea, Forrest D.	Owen, Wm. V.	

Iowa: Iowa State College, Ames. State leader, J. H. Muncie; cooperating agent, R. K. Bliss, Director of Extension; D. L. Porter, Extension Pathologist; collaborating pathologists, Dr. I. E. Melhus and S. M. Dietz; State law-enforcing agent, F. A. Fenton, State Entomologist; stenographer, furnished by the State; office assistant, Lyrel Johnston; field assistants:

Adamson, Ralph W.	Inman, Forrest G.	Raeder, Lewis D.
Berkman, Anton H.	Kent, James K.	Randall, Glenn O.
Brookhart, Charles E.	Locking, William A.	Rutter, Frank J.
Carmichael, Nathanial N.	Martin, George W.	Sechrist, H. W.
Crawford, Raymond T.	Miller, Paul R.	Smith, Marion A.
Eggers, William C.	North H. F. A.	Swenson, Severn H.
Grant, Kenneth R.	Pammel, Harold E.	Yount, Marion E.
Hill, Alva C.	Porter, Donald R.	Zeman, Edward M.
		Schaal, Lawrence H.

Michigan: Agricultural College, East Lansing. State leader, Walter F. Reddy; cooperating agent, R. L. Baldwin, Director of Extension; collaborating pathologist, Dr. G. H. Conns; State law-enforcement agent, L. R. Taft, State Inspector of Nurseries, and Howard A. Taft, Agent; stenographer-clerk .. ....; field assistants:

Coe, Clato R.	Lewis, Herdis L.	Ripatte, Carl H.
Dressel, Elvin D.	McIntyre, Arthur C.	Sindecuse, Earl A.
Eckel, Joseph A.	McIntyre, Charles W.	Strong, Forrest C.
Gaffney, Bernard F.	Mathieson, Sigurd T.	Swanson, Hugo T.
Hesler, L. R.	Moore, Lucius H.	Tilford, Paul E.
Kerr, Kenneth R.	Olson, George W.	
Lafene, Ben W.	Parson, Howard E.	

Minnesota: University Farm, St. Paul. State leader, Leonard W. Melander; cooperating agent, F. W. Peck, Director of Extension; collaborating pathologists, Dr. E. M. Freeman and Dr. E. C. Stakman; State law-enforcement agent, A. G. Ruggles, State Entomologist. (The State Department of Agriculture is cooperating in the survey with a force of about 20 field men under an annual appropriation of $20,000 in the biennium ending June 30, 1925.) Stenographer-clerk, Helen W. Barrett; field assistants:

Anderson, C. George	Grumke, Edward C.	Mason, Gerald
Auburg, Charles	Hecker, Henry W.	Nelson, Lloyd I.
Benner, Jefferson S.	Hinkley, Charles O.	Peterson, George M.
Bevan, Roland C.	Hurlburt, Henry C.	Phillips, John W.
Brunkow, Karl F.	Jessup. Leland A.	Purdy, David W.
Crosby, Lewis L.	Johnson, Everett R.	Shephard, Varl M.
Emerson, William	Knight, Robert H.	Vacha, Jerry A.
Flor, Harold H.	Kunkel, Paul W.	Van Cleve, Charles W.
Fobes, Franklin E.		Youngdale, Walter E.

Montana: State College of Agriculture, Bozeman. State leader, W. N. Christopher; cooperating agent, F. S. Cooley, Director of Extension; collaborating pathologist, H. E. Morris; State law-enforcement agent, J. C. Woods, Horticultural Inspector; stenographer-clerk (part-time), Florence Mashin; field assistant, Wm. L. Popham.

Nebraska: College of Agriculture, University Farm, Lincoln. State leader, A. F. Thiel; collaborating agent, W. H. Brokaw, Director of Extension; collaborating pathologist and law-enforcement agent, Mr. G. L. Peltier; stenographer-clerk, Burnetta Rose; field assistants:

Adams, Harold M.	Lindstrom, David E.	Simpson, Willard J.
Barth, Charles E.	McDermott, Ralph D.	Slosson, Clarence
Bruner, William E.	Moore, John L.	Summers, Eaton M.
Burnett, K. F.	Peltier, George L.	Thurber, Claude W.
Dittus, Benjamin F.	Riddick, Julian W.	Tullis, E. C.
Fitzpatrick, Thos. J.	Rohrbaugh, Percy	Weakley, Harry E.
Freidli, Jacob	Rulla, Loyal L.	Weaver, Walton O.
Frost, Luther A.	Samsel, Leon G.	Weir, Robert E.
Jones, Gomer V.	Samson, Rayburn W.	
Kotler, Edmund J.	Scrivner, Forrest J.	

North Dakota: Agricultural Experiment Station, Agricultural College P.O. State leader, George C. Mayone; cooperating agent, G. W. Randlett, Director of Extension; collaborating pathologist, H. L. Bolley; State law-enforcement agent, Joseph A. Kitchen, Commissioner of Agriculture; stenographer-clerk, furnished by the State; field assistants:

Ahlness, Emil	Herbison, Herbert W.	Severson, Albert S.
Archer, Verne R.	Irick, Ralph W.	Severson, Leonard N.
Bentley, Ronald C.	Kadlec, Geo. C.	Stewart, John C.
Brush, Harper J.	Kjorlie, Hilmen E.	Trowbridge, Vernon H.
Denis, Daniel J.	Meldahl, Theodore C.	Trumbull, Francis W.
Ferguson, Earl G.	Mowris, Lyle E.	Welch, Seth A.
Flamer, Anton E.	Ostrom, Martin H.	Wells, Chas. F.
Gass, William B.	Roberts, Franklin W.	Wick, Bert

Ohio: Botany Department, Ohio State University, Columbus. State leader, John W. Baringer; cooperating agent, H. C. Ramsower, Director of Extension, and E. E. Clayton, Extension Pathologist; collaborating pathologist, W. G. Stover; State law-enforcement agent, E. C. Cotton, Chief, Bureau of Horticulture; stenographer-clerk, Mrs. M. E. Joice; field assistants:

Brooks, Albert N.	Johnson, Howard W.	Speed, Wm. S.
Dobbins, Raymond A.	May, Curtis	Timmons, Geo. W.
Hagelbarger, Ralph H.	Meyer, Bernard S.	
Henning, William L.	Prather, Earl M.	
Hoddinott, Ira S.	Runnels, Harmon A.	

South Dakota: College of Agriculture, Brookings, State leader, Lynn D. Hutton; cooperating agent, W. F. Kumlien, Director of Extension; collaborators, Dr. A. N. Hume and E. J. Petry; State law-enforcement agent, H. C. Severin, State Entomologist; stenographer-clerk, Emma Fairchild; field assistants:

Aldrich, Merton Q.	Holmes, John F.	Moore, John W.
Anderson, Norris J.	Hutton, Paul M.	Murray, Joe F.
Beals, Dan L.	Kurtz, Theodore	Sayre, Lawrence C.
Brictson, Abner J.	Kurtz, Wm. A.	Sopp, Frank J.
Bulger, Raymond	Larson, Guy A.	Staven, Julian I.
Coffey, Frank	Locke, Rush B.	Thune, Leonard A.
Davies, Ross D.	Mears, Kirk	Underwood, Paul C.
Fairchild, Jasper S.	Michaels, Walter H.	Walter, Glenn L.
		Welch, Frank F.

Wisconsin: Department of Agriculture, State Capitol Annex, Madison. State leader, Noel E. Thompson; cooperating agent, K. L. Hatch, Director of Extension, and R. E. Vaughn, Extension Pathologist; collaborating pathologists, Dr. L. R. Jones and J. G. Dickson; State law-enforcement agent, Stanley B. Fracker, State Entomologist; stenographer-clerk, Ida T. Gooll; field assistants:

Bryan, Geo. S.	Holt, Earle F.	Schaars, Marvin A.
Corbett, Kenneth R.	Horne, Daniel O.	Schuster, Milford W.
Damsheuser, Carl W.	Longenecker, Geo. W.	Schultz, Ernest R.
Dickson, Allan D.	McKay, Frank D.	Stevens, Henry
Federer, Leo J.	Rankin, Eugene J.	Sperl, Norman M.
Fuehrer, George A.	Rosenkamp, Frederick W.	Walquist, Frank
Gerhardt, Oscar H.	Russell, Elmon E.	Weber, Clarence V.
Hill, Leslie A.	Sazama, James	Wolfson, Alfred M.

Wyoming: College of Agriculture, University of Wyoming, Laramie. State leader, Ralph U. Cotter; cooperating agents, A. E. Bowman, Director of Extension; State law-enforcement agent, A. B. Faville, President, State Board of Horticulture; stenographer-clerk, furnished by State.

PRELIMINARY REPORT OF INVESTIGATIONS ON THE SPREAD OF ESCAPED BARBERRY BUSHES AND METHODS FOR THEIR ERADICATION.

E. - Dr. W. W. Robbins, Botanist.

1. Vitality of Seeds from Removed Barberry Bushes.

(a) On September 27, 1921, berries were collected from bushes which had been dug August 1, 1921. The berries were somewhat shrivelled, but the seeds appeared normal. One thousand berries (approximately 2000 seeds) were scattered on loose dirt, over an area of one square rod, covered with a sprinkling of dirt and then of leaves. On June 6, 1922, there were 282 seedlings on this area.

(b) Berries were collected on the same date from standing bushes and placed under the same germinating conditions as above. On June 6, 1922, there were 307 seedlings.

(c) A frequent observation is the presence of great numbers of seedlings beneath the dead brush of bushes dug when in fruit.

The above facts emphasize the necessity of disposing of berry-bearing shrubs after they are grubbed out. Probably the best procedure is to pile the bushes and burn them. We have no data yet as to how soon berries mature, but thus far we are safe in concluding that berry-producing plants dug from August 1 (very probably earlier) and later should be disposed of, when feasible, to prevent seed germination.

2. Seed Production of Sprouts.

The stopping of barberry seed production is of great importance. In a number of the States, there are areas with a large number of escaped bushes, varying widely in age, from one-year old seedlings to plants 15 to 25 years old. While it has not been possible to get all plants regardless of age, it has been the policy to remove all seed-producing plants and thus eliminate the spread by seeds.

The question of particular importance to us in this regard is: When will sprouts from grubbed bushes produce flowers and fruit? We present observations as follows: Bushes were dug in the fall of 1920. That same fall sprouts were produced. During 1921 there was vigorous growth of these sprouts; and in the spring of 1922, flowers were produced in abundance. In other words, in two years from digging, a bush may be seed producing. Two or three-year old plants from seed have not been observed as producing seed. But two-year sprouts from old roots are capable of seeding. This fact suggests the need of paying particular attention in our 1922 re-scouting and checking to bushes dug in 1920 (or earlier), seeing to it that seed-producing sprouts, at least, are dug.

3. Delayed Germination of Barberry Seeds.

Isolated bushes dug in October, 1920, were left lying on a steep slope in a pasture lot. When these bushes were turned over the spring of 1922, many seedlings were under the brush. A number of these had sprouted in 1921 but a considerable number were of 1922 germination as was evidenced by the green cotyledons. Seed had rested in the soil during at least two winters, and then germinated. It is quite probable that under certain conditions barberry seeds will rest in the soil longer than two winters and still retain their germinating power. We have no data yet on this point.

4. Method of Digging.

We have observed grubbed bushes, prostrate on the ground, that are producing green leaf tissue. Examination of such bushes shows that either one or another or two conditions exists:

(a) The bushes were grubbed about, and then pulled over and dragged a ways, but one or more roots were left partly in contact with the soil. Even this small lead to the soil was sufficient to nourish a portion of the removed bush;

(b) The bushes were completely severed from the soil, but a large ball of earth was left adhering to the crown. The bush and adhering ball of earth were thrown to one side. In some instances there was enough moisture in the ball of earth to maintain the vitality of the stubs of roots, and their contact with the soil was sufficient to enable them to produce secondary roots and establish a new hold on the soil. This situation occurs when bushes are dug in wet weather, or in moist woodlands.

DIG BUSHES CAREFULLY.
BE SURE TO SEVER TOP FROM CROWN.
DO NOT LEAVE BALLS OF EARTH ON ROOTS.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 July 10, 1922 No. 15
Personnel (July 1-10) and Field Station (June 16-30) Issue.

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PERSONNEL ITEMS

Dr. H. B. Humphrey, pathologist in charge of cereal disease investigations, returned to Washington June 30. He made an inspection of the flag-smut investigations in Illinois and Missouri, and stopped at Urbana and Bloomington, Ill., and LaFayette, Ind., to confer with employees of the Office and cooperating State officials regarding the cooperative experiments with the root, stalk, and ear rots of corn. At St. Paul, Minn., Dr. Humphrey inspected the experimental plats of wheat at the University Farm. During an automobile trip of 110 miles out of Minneapolis very little, if any, stem rust was found in field of wheat. At Madison, Wis., Dr. Humphrey consulted with experiment station officials concerning the rosette disease of wheat, the nematode disease of wheat and rye, and seedling blight and scab of wheat. A day was spent in the field near Marshall, Wis., inspecting the results of experiments on barberry eradication by the application of chemicals.

C. H. Kyle, agronomist in charge of corn investigations in the southern States, returned to Washington July 5. In the experiment plats at Knoxville, Tenn., Mr. Kyle found corn growing very well. Considerable soil erosion on the rolling land had been caused by heavy rains, but it is believed that the many replications involved in all the plantings of the major projects will yield consistent results at harvest time.

It was possible to note with a fair degree of regularity some of the effects of selfing for different periods of time and of outcrossing at the end of each of these periods. In general, these plantings seem to show that after three years of selfing the appearance of the strains is improved by the subsequent two or three years of selfing and selection. The effect of this improvement also could be traced in crosses between unrelated lines, the crossing having been made at the end of the several periods of selfing.

Miss Pauline B. Long, stenographer and typewriter, was transferred from the War Department on June 23 for duty in this Office.

A. A. Potter, formerly assistant pathologist in smut investigations, who recently was given a temporary appointment in order to collaborate with L. E. Melchers, agent of this Office, and plant pathologist at the Kansas Agricultural Experiment Station, in the preparation of a joint manuscript on corn smut, finished the manuscript on June 29. Mr. Potter's appointment was terminated June 30.

Miss Grace B. Roshelly was appointed stenographer and typewriter in this Office, effective June 26, by transfer from the War Department.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, returned to Washington June 30 after attending conferences with officials at agricultural experiment stations in the Atlantic Coast States, the Southwest, the Pacific Coast States, and in North Dakota, Wisconsin, Minnesota, and Illinois. In Alabama and South Carolina Dr. Tisdale found grain badly injured by leaf rusts. No rust was found in New Mexico because of the dry weather conditions, although a small amount of barley smut was noted. On the Pacific Coast there also was no rust but a great deal of bunt of wheat. Dr. Tisdale attended the conference of State and other officials on the flag-smut situation in Illinois and Missouri on June 19 and 20, and spent some time in consultation with agricultural experiment station officials at Urbana, Ill., in connection with the proposed publication of cooperative experimental results on flag smut of wheat.

Field Assistants in Barberry Eradication

The following persons were appointed as field assistants in barberry eradication in the States named below, effective July 1, 1922.

Colorado: Bruce J. Thornton.

Illinois: Walter W. Ashbaugh, Emil F. Guba, Darrell I. Manly, Siegfried P. Harter, Edwin E. Honey, Charles J. Huxel, Mark A. McCarty, Andrew J. Moyer, Harry C. Neville, Carl J. Ostrom, Clifford F. Reid, Ray H. Roll, Paul T. Sanders, Hubert K. Snively, James A. Twardock, and Amy G. Weedon.

Indiana: Henry M. Burlage, Stanley Castell, Albert W. Heine, Ross L. McCally, Glenn H. McKenzie, Reuben C. Marshall, Leo D. Miller, William V. Owen, Ornley Parker, and Harold J. Wegel.

Iowa: Ralph W. Adamson, Anton H. Berkman, Charles E. Brookhart, Nathaniel R. Carmichael, Raymond F. Crawford, William C. Eggers, Kenneth R. Grant, Alva C. Hill, Forrest G. Inman, Lyrel Johnston, James K. Kent, William A. Lockling, George W. Martin, Ezra P. Mauk, Paul R. Miller, Henry F. A. North, Donald R. Porter, Lewis D. Raeder, Glenn O. Randall, Frank J. Rutter, Marion A. Smith, Severn H. Swenson, Marion E. Yount, and Edward M. Zeman.

Michigan: Clato R. Coe, Elvin D. Dressel, Joseph A. Eckel, Bernard F. Gaffney, Lexemuel R. Hesler, Kenneth R. Herr, Ben W. Lafene, Herdic L. Lewis, Arthur C. McIntyre, Charles W. McIntyre, Sigurd T. Mathieson, Lucius A. Moore, George W. Olson, Howard E. Parson, Carl A. Ripatte, Earl A. Sindecuse, Forrest C. Strong, Hugo T. Swanson, and Paul E. Tilford.

Minnesota: Karl F. Brunkow, Lewis L. Crosby, William M. Emerson, Harold H. Flor, Edward C. Grunke, Henry W. Hecker, Charles O. Hinkley, Henry C. Hurlburt, Leland A. Jessup, Everett A. Johnson, Robert H. Knight, Gerald Mason, Lloyd I. Nelson, George M. Peterson, John W. Phillips, Vard M. Shephard, and Charles W. Van Cleve.

Nebraska: Harold M. Adams, Charles E. Barth, William E. Bruner, K. F. Burnett, Jacob Friedli, Luther A. Frost, Gomer V. Jones, Edmund J. Kotler, David E. Lindstrom, John L. Moore, George L. Peltier, Julian W. Riddick, Leon G. Samsel, Harry E. Weakley, and Robert E. Weir.

North Dakota: Emil W. Ahlness, Verne R. Archer, Ronald C. Bentley, Harper J. Brush, Daniel J. Denis, Earl G. Ferguson, Anton E. Flamer, William B. Gass, Herbert W. Herbison, Ralph W. Irick, George C. Kadlec, Hilmen E. Kjorlie, Theodore C. Meldahl, Lyle E. Mowris, Martin H. Ostrem, Franklin W. Roberts, Albert S. Severson, Leonard N. Severson, John C. Stewart, Vernor H. Troweridge, Francis W. Trumbull, Seth A. Welch, Charles F. Wells, and Bert Wick.

Ohio: Albert N. Brooks, Raymond A. Dobbins, Ralph H. Hagelberger, William L. Henning, Ira S. Houdinott, Howard W. Johnson, Curtis May, Bernard S. Meyer, Earl M. Prather, Harmon A. Runnels, William S. Speed, George W. Timmons, and Ervin J. Utz.

South Dakota: Merton Q. Aldrich, Norris J. Anderson, Dan L. Beals, Abner J. Brictson, Raymond Bulger, Frank Coffey, Ross D. Davies, Jasper S. Fairchild, John F. Holmes, Paul M. Hutton, Theodore Kurtz, Guy A. Larson, Rush B. Locke, Kirk Mears, Walter H. Michaels, John W. Moore, Joe F. Murray, Lawrence C. Sayre, Frank J. Sopp, Leonard A. Thune, Paul C. Underwood, Glenn L. Walter, and Frank F. Welch.

Wisconsin: George S. Bryan, Kenneth H. Corbett, Carl W. Damsheuser, Allan D. Dickson, Leo J. Federer, George A. Fiedler, Oscar H. Gerhardt, Leslie A. Hill, Earle F. Holt, Daniel O. Horne, George W. Longnecker, Frank D. McKay, Eugene J. Rankin, Frederick W. Roewekamp, Elmon B. Russel, James Sazama, Marvin A. Schaars, Milford W. Schueler, Ernest R. Schulz, Norman M. Sperl, Henry Stevens, Frank Walquist, Clarence W. Weber, and Alfred M. Wolfson.

MANUSCRIPTS AND PUBLICATIONS

A brief paper entitled "The Influence of Temperature on the Spore Germination of Ustilago zeae," by Edith Seymour Jones, formerly scientific assistant in cereal disease investigations, was transmitted on July 1 for publication in the Journal of Agricultural Research.

A manuscript entitled "A Statistical Study of the Comparative Morphology of Biologic Forms of Puccinia graminis," by Moses N. Levine, assistant pathologist in cooperative cereal disease investigations at Manhattan, Kans., was transmitted July 3 with the recommendation that it be published in the Journal of Agricultural Research.

A short article by Dr. H. V. Harlan and Merritt N. Pope, entitled "Many-Noded Dwarf Barley," was approved on July 6 for publication in the Journal of Heredity.

A manuscript entitled "Effects of Selection on the Yield of a Cross Between Varieties of Corn," by Fred D. Richey, agronomist in charge of corn breeding and cultural investigations, was transmitted July 6 for publication as a professional paper in the Department Bulletin series.

A manuscript entitled "The Inheritance of Growth Habit and Resistance to Stem Rust in a Cross between Two Varieties of Common Wheat," by Olaf S. Aamodt, assistant pathologist in cooperation with the Minnesota Station, was transmitted on July 7 for publication in the Journal of Agricultural Research.

A manuscript entitled "The Relation of Certain Soil Factors to the Infection of Oats by Loose Smut," by Lucille K. Bartholomew and Edith Seymour Jones, was transmitted on July 10 for publication in the Journal of Agricultural Research.

A manuscript entitled "The Influence of Temperature, Moisture, and Oxygen on the Spore Germination of Ustilago avenae," by Edith Seymour Jones, was transmitted on July 10 for publication in the Journal of Agricultural Research.

Galley proof was read July 8 of Farmers' Bulletins 1080 and 1081, entitled, respectively, "The Hard Red Winter Wheats" and "The Hard Red Spring Wheats," by J. Allen Clark and John H. Martin.

Page proof was read July 2 of the revised edition of Farmers' Bulletin 786, entitled "Fall Sown Grains in Maryland and Virginia," by T. R. Stanton.

Reading of page proof of pages 1-156 of Department Bulletin 1074, entitled "Classification of American Wheat Varieties," by J. Allen Clark, J. H. Martin, and Carleton R. Ball, was completed on July 10.

Annual Reports of Field Station Investigations

All of the annual reports of cereal investigations on field stations for the calendar year 1921 have been typewritten, bound, and distributed. These reports comprise more than 2,000 typed pages, including several hundred pages of tabulated matter. This date is considerably earlier than that on which the same work was completed last year but not so early as we would like to have it done. Field men in charge of the work at the more southern stations, where harvesting and thrashing are completed early in the summer, are requested to use every effort to prepare their reports and submit them as early as possible in order that they may be typed and out of the way before reports from the more northern stations have been received. In this way, the heavy extra work of writing these reports will be better distributed and a more prompt completion and return of the bound reports to the stations will be insured.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report).

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamnerly) (No report)

VIRGINIA

Arlington Farm, Rosslyn (Cereal Project, Oats, T. R. Stanton) (July 1) Harvesting of the winter oat nursery was completed on June 26. Practically all the strains of the late-maturing varieties were badly lodged by wind and rain storms occurring early in June. The severe wind storm on the evening of June 11 probably did the most damage. This made the task of harvesting most difficult, in addition to greatly reducing the yields of these late strains, as they failed to fill properly after lodging.

Of the relatively large number of selections from crosses between Fulghum and various Culberson strains, and Fulghum and Hutcheson, less than 50 per cent were saved for further experimentation. After being threshed and carefully inspected the most promising will be sown in rod rows next year to determine their winter resistance.

Of the new early varieties, Ferguson's Navarro attracted considerable attention. It ripened just a few days later than Fulghum, and at maturity the straw and glumes were of a distinct bright yellowish-red similar to that of Fulghum and Red Rustproof, but much more pronounced. It also has a very short straw. The origin of this oat has not been determined, but some of its characteristics, however, indicate that it probably was obtained as a selection from a cross between Fulghum or Red Rustproof and Swedish Select or similar variety.

(Corn Project, H. S. Garrison)(July 6)

Some of the selfed strains in Mr. Richey's early planting and the early varieties of Mr. Willier's popcorn are beginning to tassel so that some hand pollinations have already been made. The earlier varieties in Mr. Hartley's early planted varietal tests also are in full tassel.

Counts and notes have been made on some of the strains that are being used for genetical studies.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report).

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (July 1) The wheat harvest is now being completed along the northern border of the state, and threshing has begun in the southern portion. The first wheat of this year's crop has just reached the market from Jasper County in southwestern Missouri. Oats harvest has begun in the southern half of the State, and will be general within another week.

The weather during the latter half of June was prevailingly favorable for harvesting, and for crop growth. During the last two days, however, we have had some rather heavy showers in this locality, and our oats crop was badly lodged by a heavy rain last night. The rain, however, was beneficial to the corn which is now in very good condition.

We have begun corn pollination in our corn breeding project during the past week. The pollinating season will last for about five weeks. We are expecting to make about six thousand pollinations, of which about fifteen hundred will be in connection with the plant improvement work and the remainder with genetic investigations.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (July 3) Since my last report growing conditions have improved and the corn has made rapid progress. Some of the earlier strains of the selfed lines are coming into tassel, and hand pollinating will soon be in order.

Mr. Richey and Mr. Kyle arrived on Friday, June 30. The latter is making a study of the several strains and crosses and taking field notes. He plans to return to Washington Tuesday or Wednesday of this week. Mr. Richey will be here longer in order to get the hand pollinating under way.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report)

Iowa State College, Ames (Barberry Eradication, R. H. Porter). (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert). (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (June report) Three men were in the field during the greater part of June doing resurvey work in DuPage and Lake Counties in northern Illinois. H. L. Dixon made some epidemiology studies in Lake County. The State Leader, in company with R. J. Noble, pathologist at the Minnesota Agr. Exp. Station, made a trip through central Illinois June 8, 9, and 10 for the purpose of observing rust conditions. A slight infection of stem rust on hordeum jubatum close to barberries was found on a farm near Forrest, Ill., on June 8.

On June 30 a conference of all the field men starting work July 1 was held in Urbana. The men were carefully instructed in regard to the details of the work. Dr. H. W. Anderson, who had charge of the barberry eradication work in Illinois in 1918, Leo R. Tehon who was State Leader from 1919 to February, 1922, and P. A. Glenn, of the State Department of Agriculture, spoke at the conference and made many helpful suggestions.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (June report). With abundant rainfall during the past week the experimental plats in the vicinity of Lafayette are showing much improvement. The drought for the preceding three weeks seriously stunted the growth of the plants.

The general fields of corn in this locality have been much retarded in growth and many are showing reduced stands caused by seedling blight. Estimates approximate 50 per cent reduction in certain fields where infected seed stocks were used.

On June 23 the rag-doll method of testing seed corn was given as a laboratory exercise during the Short Course for County Agents at the University. A few of the difficulties which beset some of the agents were described and discussed. The relative importances of the organisms and crop relations were indicated. Dr. H. B. Humphrey and Dr. A. G. Johnson were present during the session and discussed the wheat flag-smut and wheat scab situations, respectively. Over 75 people were present for the instruction.

Reports from these County Agents indicate excellent results from the testing of seed corn in community testers by the rag-doll method. Over fifty county agents in Indiana conducted or supervised these community testing plants.

On June 17 the sweet corn plantings were made for the Seed Laboratory of the U. S. Bureau of Plant Industry. Four hundred and fifteen samples are being tested in the field for germination, relative vigor of growth and seed transmission of disease.

G. N. Hoffer went to Gibson City, Illinois, June 15 to meet Dr. G. S. Bohart, of the National Canners' Research Laboratory, and to examin the experimental sweet corn packs prepared last fall with him. Sweet corn from various fertilizer plats had been canned for the purpose of studying the effect of fertilizers on the quality of the corn. The results have been especially good, and this work prepares the way for more extensive and detailed experiments to be conducted at Hoopeston and Gibson City, Ill., this year.

Dr. H. B. Humphrey and Dr. A. G. Johnson visited the laboratory June 23 and 24. Conferences were held relative to the work for the next fiscal year.

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

Botany Department, Purdue University Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson) (No report)

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) Territory equivalent to three-fourths of one county was covered, in June, by an original farm-to-farm survey. Notes were made on the spread of rust from barberry bushes to wheat and the resulting damage. These data are to be put in map form.

M. T. Meyers has been making aerial flights, at Dayton, Ohio, for the purpose of examining the spore content of the upper atmosphere. One flight was made in May and two were made in June. The exposed slides were sent to St. Paul for identification of the captured spores.

On June first the aecial stage of stem-rust infection was present on barberries generally throughout Ohio. By June 20 most of the infection, in the Miami Valley district, had become black and dry. The severity of infection varied considerably, from a trace to heavy, according to local conditions.

During the last of May and early June black stem rust was making its appearance on wheat in several places in west central Ohio. Prior to June 5 stem rust on wheat, in the Miami Valley, was confined to a radius of 500 feet from infected barberries. None could be found beyond this limit. By June 20 stem rust on wheat near infected bushes had become heavy. In some of these instances the yield will be much reduced. On this date a trace of stem rust on wheat could be found in widely separated sections of Ohio. Farmers were cutting wheat in central Ohio during the last two weeks of June.

Large escaped barberry bushes near Sidney, Ohio, were treated on the 10th of last August with various quantities of kerosene. The treated bushes were next observed in the following November and no resulting damage could be noted. However, upon reinspection two weeks ago it was observed that all bushes so treated apparently were dead. No leaves came out on the old bushes and no sprouts have appeared from the roots. The bushes were 20 to 30 years old and approximately 12 feet tall. The kerosene dosage ranged from one to two and one-half gallons per bush. The bushes were located on the top of a hill. We are planning to use more kerosene, in various quantities, on different sized bushes, in different types of soil.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (June report) During the month of June resurvey work was completed in Lenawee, Hillsdale, Branch, and St. Joseph Counties. St. Joseph was the first county completed in the farm-to-farm survey last season. In resurveying five counties this spring it has been evident that there bushes are properly removed from cultivated areas they do not present a serious problem by sprouting. Possibly the men may be more painstaking with a limited number of bushes, but it is easier to gain the cooperation of the property owner and he assumes the responsibility to see that his premises are free from bushes.

In the escaped areas it is a difficult task to remove many bushes and get all of the roots. Again it is difficult to impress upon the farmer that a small shrub can do much harm. He thinks in terms of bigger bushes than the small property owner and is too easily satisfied as to what constitutes eradication. Within the past month we have visited areas where extreme care had been taken to dig all seedlings and we have found seedlings which could not have been apparent at the time of the first visit. This means that certain areas will need to be placed on a regular schedule for revisitation.

We are planning to use our entire squad during the first month for original survey work, but we are going to make certain that sufficient time is available to bring our resurvey up to date. Without doubt areas which were covered in the original survey of last season should be visited this season.

Our entire squad gathered today for July first, and if their vim, vigor and vitality holds out it is going to be difficult to restrain them from removing all plant life from Michigan, whether such life smacks of barberries or not.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson). (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (June 26) The rust development this year to date has presented some rather interesting but puzzling situations. By June 15 the limit of infection was near the northern boundary of Missouri. This seems to be about as far north as the rust developed from overwintering or from a south-to-north spread. Reports indicate that in this area the condition of the rust was somewhat spotted. Particularly in Missouri, Kansas, and Oklahoma there appeared to be local centers of infection; hence, the rust over this area was not uniformly heavy, although there appeared to be considerable rust throughout this region. Butler estimates an average of 20 per cent infection, with slightly more damage in Texas this year than usual. North of this area all the rust on grasses and grains that had been found up to June 15 was in the neighborhood of infected barberry bushes. By June 26 a trace of rust was found as far north as Grand Forks, N. Dak., and was quite generally distributed but was very light. Throughout the spring-wheat area about all that can be found is a trace here and there, except in fields near barberry bushes. If the weather is favorable, there appears to be sufficient inoculum generally enough distributed to produce a rather serious epidemic. It is interesting to note that away from known barberry areas the rust appeared almost as early in Minnesota as in Iowa. Indeed, the rust seems to be even more generally distributed in Minnesota than in Iowa at present. Particularly is this true for the western portion of Iowa, where it seems to have been rather dry. This would seem to indicate rather clearly that the rust in Minnesota could not be traced to the general spread of rust from the south. Much valuable information has been obtained this season on the spread

of rust from barberry busnes. The epidemiology force working in cooperation with a number of the State leaders has mapped the spread of rust from barberries. In one striking instance primary infection from this cause has been traced to a distance of a mile and a quarter, while secondary infection has been clearly traced to a distance of about six miles.

The number of biologic forms of stem rust on wheat has now reached a total of 37. Thirty-five of these have been found in the United States. Two distinct biologic forms of stem rust on oats have been discovered recently. A race of Puccinia graminis found in nature on Agropyron repens (quack grass) has been found which seems to be quite distinct from any of the other stem rust forms. This new form on Agropyron repens has been collected from several widely spearated localities. At the present time inoculation experiments are being carried on with various collections of stem rust from this country and abroad. Work is now being completed on the experiments to determine the effect of temperature and humidity on the development of aeciospores on barberry, also on the effect of these factors on the germination of teliospores and the viability and germination of aeciospores.

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (June report) Considerable progress was made during June in this State along various lines. Several lectures, including some practical field demonstrations were given. Epidemiology studies, in cooperation with the forces especially engaged in these studies were carried on and a field force was put on the survey June 16.

On June 2 the State leader conducted a successful demonstration at Northfield, Minn. A group of about 25 men, including the Governor of Minnesota, the President of the Northern Pacific Railroad, several Vice-Presidents of other railroads, elevator men and millers, was shown in the field how barberry busnes spread rust directly to quack grass. They had the opportunity of observing that the rust was much heavier nearer the busnes than it was a hundred yards away. Several good results came from this demonstration, the most important of which was through the General Manager of the Chicago, Milwaukee, and St. Paul Railroad, who sent out instructions to all his agents, on the whole system, to get in touch with anybody who was connected with the barberry eradication campaign and to find out where they could be of most assistance in the community in which they were stationed. On June 9 and 10 demonstrations were given before the Bankers' Conventions at Winnebago and Detroit. Each of these conventions included bankers from several counties. Superintendents of line elevators for the various big grain companies in Minneapolis were sent out to University Farm for the purpose of learning about the characteristics of the common barberry and its relation to rust. They came out in small groups and were given a thorough demonstration. A total of about 100 of these men were shown the danger of the common barberry to his community and business. One portable county fair demonstration was sent to the Norman County Fair. We expect to have some type of barberry demonstration in 86 counties in Minnesota this year.

When barberry plantings were located near grain fields, observations were made and the reports were immediately turned over to the epidemiology forces. The most important phase of this was the convergence of epidemics started by individual plantings. A detailed report will be found in this issue of the Courier under Stem Rust Investigations, Minnesota. Observations

Observations were made in fields at random in 15 counties, ten of which were in the eradicated area. Slight infection of stem rust on wheat was found as far south as [illegible] County. No rust could be found in the [illegible] and [illegible] Counties. The first stem rust was noted in the eastern edge of Swift County. From there east, there was no trouble in finding stem rust in the fields. It became easier to find as we worked eastward toward the uneradicated area.

Survey work in only one county was done by Federal forces in June. However, on the 16th, 20 men employed on State funds were put into the fields in the following counties: Mille Lacs, Kanabec, Wright, Anoka, McLeod, Hennepin, Scott, Rice, and Goodhue Counties. As was predicted, they are finding more barberry bushes in this area than were found in the counties where they worked last year. On the original survey, 236 bushes were found in 27 plantings in 11 counties. 174 bushes were destroyed. Prospects for the July survey look bright. There will be a total of 49 men, 29 Federal and 20 State, in the field.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (July 1) June was a very dry month. The wheat harvest is practically over, and the indications are that the yield will average around 10 bushels per acre.

The sixth date-of-seeding plats were seeded this morning. In spite of the dry weather the sorghums and broomcorn look well and are making rapid growth.

With the exception of the later date-of-seeding experiments and one series of milo hybrids the thinning is completed. Roadways have been trimmed and at present the work on the project is hoeing weeds.

Maximum temperature for last half of June, 100° on the 29th; minimum for same period, 60° on the 21st. Precipitation for June, 0.17 inch, which fell in four showers.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (July 1). The total precipitation for June was 4.01 inches, 1.63 inches of this fell on June 30. June was comparatively free from dry, hot weather except for a short period between the 10th and 16th. This was the critical period for oats and barley and the short drought resulted in shrivelled grain.

The Blackhull and Mariout barleys withstood the drought to the best advantage because of their earliness. Kanota probably will prove to be the best yielding oats. The spring wheats have made a good showing this year. Prelude and Hard Federation have been harvested and because of their earliness will be the outstanding varieties. All of the oats and barley varieties have been harvested.

Winter wheat will be ready for harvest about July 5. Yields of from 15 to 20 bushels will be possible on many of the plats, and throughout the country there has been much improvement in the crop. However, stem and leaf rust is quite prevalent in a number of strains. Kanred is again showing much resistance from this trouble.

All of the sorghums have been thinned to a uniform stand and a part of the experimental plats laid by for the season. In another day all of the varietal plats will have been given the final cultivation. Most of the corn is about four feet high and the earlier strains are tasseling. The prospects for row crops have never been better.

The writer, in company with Mr. A. L. Hallsted, of the Office of Dry Land Agriculture, recently made a trip into northwestern Kansas for the purpose of studying wheat and barley conditions and seed-bed preparation. One of the most profitable visits made was at the farm of Mr. Albert Weaver, of Bird City, Kansas. He has 4,000 acres in wheat this year and 1,700 acres of ground under fallow. Last year he shipped out 67 carloads of wheat. He is almost exclusively a Kanred grower and has shipped out thousands of bushels of pure seed. Before seeding all of his seed is carefully graded and treated for smut. Mr. Weaver has worked out his own system of farming which is a four-year rotation with one year of fallow and three of wheat. The land is intensively fallowed during the one year, but little attention is given the land during the three cropping seasons. For fallow Mr. Weaver likes to disc his ground in April or May to hold down the weeds. He plans to finish his plowing by June 20. He usually follows his plowing with a disc set at a slight angle and weighted down with about 75 pounds in order to break down the clods and firm the ground. To hold down the weeds he uses a Faulker harrow. He seeds two pecks of wheat to the acre and believes in spring cultivation to reduce or tear out a part of stand if it appears too thick in the spring. For a number of years Mr. Weaver has averaged from 65 to 75 bushels for each four-year cycle, including good and bad years. This year his fallow wheat will run from 35 to 40 bushels to the acre.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (June 16) The weather conditions during the first half of June were exceptionally favorable for crop prospects. They are as good as if not better than, I have ever seen them at this time of the year. Winter wheat is heading, early maturing barley, oats, and spring wheat are nearly fully headed and rye is in full bloom. Our corn has all emerged to very satisfactory stands and the first cultivation has been given. Practically all of our sorgo plats and rows are up to good stands and growing rapidly. Local showers have kept the moisture supply in the soil from being depleted during this period of most rapid growth. About the only thing that could ruin prospects for a record crop would be hail.

Work on the house is going forward very rapidly. It is very probable that the plasterers will start work about the first of next week. The house when completed will make a very creditable addition to the station improvements and a very comfortable place to live. I wish to thank you and Dr. Ball for making the completion of the house possible. The prospect of having such living quarters as this house seems almost too good to be true to us.

The pressure of work at Akron has been so great this spring that it [illegible] not possible for me to be present at Manhattan, at the commencement exercises June 1. I should have been present to receive my Masters degree and also to be initiated into the honor societies Phi Kappa Phi and Gamma Sigma Delta to which I was recently elected. I received permission to receive my degree in absentia.

I am very glad to know that both you and Mr. Stanton will be able to visit Akron this summer. The oats experiments are rather extensive here this season. We have some 900 to 1,000 plats and rows of oats in our economic and genetic experiments. About 10 different genetic studies are being conducted with oats this season.

(June 16-30) The annual drought has appeared and as a result the bright prospects reported on June 15 have been slowly disappearing. At the present time the earlier varieties of spring oats, barley, and wheat are starting to "turn". Winter wheat probably will be ripe enough to harvest by the end of the first week in July. The dry weather has reduced the winter-wheat prospects very materially. There probably will be many fields in this section with 20 to 25 bushels of winter wheat despite the dry weather.

The weather of the past two weeks has been very favorable to corn and sorghum crops. The corn has been making an unusually rapid growth and soon will start to tassel. Sorghums are growing rapidly. The warm dry weather which has been injurious to cereal crops has been favorable for the corn and sorghums.

The annual Farm picnic was held June 24. The largest crowd ever seen on the grounds was in attendance. Probably 3000 people attended the picnic this year. The speakers were Miss M. M. Haines, State Leader in Home Economics, of the Colorado Agricultural College, and Mr. Robertson, president of the Colorado State Farm Bureau.

During the month of June Messrs. J. Allen Clark and J. H. Martin of the Office, were visitors here.

Department of Botany, Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons) (No report)

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (June report) During the month a resurvey was made of Big Horn, Crook, Laramie, Natrona, Park, and Sheridan Counties. A total of 11c bushes were removed from two properties. Rusted barberry was found at Sundance and Cheyenne. No rust was found on grains or grasses.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (No report).

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzell) (No report).

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayoue) (June 2[illegible]). A resurvey of every barberry location in the original farm-to-farm survey is absolutely necessary because many sprouts have been found. During the month of June 275 sprouts were found on 12 properties in the rural district. It becomes more convincing as the resurvey work proceeds that this work be completed.

In the original survey of Benson County 201 bushes were located on seven properties, six in the country and one in town.

A moderate to heavy infection was found on all plantings located to date. Only a slight infection of black stem rust has been found on spring wheats. Heavier infections have been found on winter wheat, especially here at the College.

On June 9 the last of a series of meetings for the field assistants who will be in the field after July first was held at the College. At this meeting the assistants were addressed by Dr. John Lee Coulter, President of the College, Mr. Gordon W. Randlett, Director of the Extension Division, and Dean H. L. Bolley of the Biology Department. As the 24 men who will be assistants in the field after July first have been schooled in their work they should be able to handle it very efficiently.

The State Leader on June 17 met with the North Dakota State Bankers' Association at Minot and gave them an address on the subject of barberry eradication. The meeting certainly proved very successful in that the bankers went on record as favoring the campaign and pledging their assistance. Since the meeting many of them have written to the State Leader concerning the work.

Plans have been made to place mounted specimens of the common barberry in every railroad depot and bank in North Dakota.

All arrangements have been made for 24 assistants and the State Leader to go into the field July 1. There will be four men to the county in a block area consisting of six counties. Six men will constitute a squad with an experienced man as leader.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (July 3). Following the comparatively heavy precipitation during the first half of June, the weather of the last half of June has been generally favorable for crop growth. The days have been cool and cloudy so that evaporation was very low. Maximum temperature for the period was 82° on June 21; minimum, 42° on June 26. Precipitation for the last half of June was 0.46 of an inch, making the total precipitation for June 3.34 inches.

Nearly all varieties in the wheat, oat, and barley varietal plats are fully headed. The wheat hybrids, sown May 15, also began to head several days ago.

Mr. W. E. Brentzel was here June 26 to inspect his flax plantings and look for plant diseases. A diligent search among the wheat varieties disclosed not a trace of stem rust on wheat. Leaf rust on Kota and other varieties seemed to be not nearly so abundant as usual. There was some flax canker and considerable wilt already in evidence. On a trip about twenty miles west of Mandan, going out on a road south of Mandan and returning by another north of Mandan we found very little flax sown. One field of fifty acres on old land about ten miles northwest of Mandan looked fairly clean and free from weeds. Though the flax was evidently sown since June 1 there was already some canker and wilt in evidence. Not a trace of stem rust was noted on wheat.

On June 29 a trace of stem rust was noted on two plants of Red Bobs wheat. One more pustule was found today on the same variety after a diligent search. These specimens were examined under the microscope to make sure that they were not elongated patches of leaf rust.

Dickinson Substation, Dickinson (Ralph W. Smith) (June 30) All crops look quite promising since the heavy rains about the middle of June. The total precipitation for the month was 6.57 inches, which has been exceeded in only two months in the past 30 years. In June, 1914, the precipitation was nearly 8 inches and in May, 1906, the precipitation was over 7 inches. On June 15 about 4 inches of rain fell in a continuous rain lasting about 17 hours. The weather was cloudy and wet for several days giving the moisture a good opportunity to penetrate into the soil without much evaporation. Crops have made rapid growth since the rain. Only about half an inch of rain has fallen since the middle of the month and more moisture is needed now as the surface of the soil is getting dry and hard.

Early varieties of spring wheat, oats, and barley are fully headed and other varieties are heading. Winter rye is beginning to ripen and promises a good crop.

Farmers report some rust on wheat. Only a trace of black stem rust has been found on the substation after careful search, but leaf rust is present on the winter-wheat varieties in amounts varying with different varieties from 1 to 25 per cent.

Crosses are being made between beardless durum and other rust-resistant pure lines of Kubanka in the hope of combining the different desirable qualities in durum wheat including good macaroni-making qualities. About 60 heads of winter grain were crossed, some being wheat-rye hybrids. Mr. J. H. Martin recently made a large number of wheat-rye hybrids, as well as hybrids between hardy varieties of winter wheat.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (July 1) During the month of June the weather has been rather cool and cloudy with considerable rain. Rain fell on 14 days, making a total of 4.43 inches of precipitation, as compared with 3.04 inches as an average of 23 years. The greatest precipitation on any one day was 0.84 inch on June 7. The maximum temperature during the month was 89° on June 21 and the minimum temperature 35° on June 30.

At present crops are in exceedingly fine condition. Most of the winter wheat in both the plat and nursery tests is in full head now. Oats and barley are about 50 per cent headed, and the earliest varieties of spring wheat are beginning to head.

Weeds are making rapid growth, but we have been fortunate in being able to keep them fairly under control to date. Jim Hill, rabbit ear, tansy, and fanweed mustards are perhaps theweeds which are giving the most trouble this year.

The main force of workers began cutting alfalfa during the past week but rain has delayed the work.

Grasshoppers are hatching in large numbers but have not migrated far from their hatching ground yet. Farmers are becoming excited about the hoppers and many are preparing to poison them. It is understood that the County intends to lend assistance in meeting a part of the expense.

Mr. Ian A. Briggs arrived here June 30 to assist with the Cereal Investigations.

The date of the Farmer's Annual Picnic has been scheduled for Thursday, July 20, which is a week earlier than the usual date of the Picnic.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report).

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report).

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (June 17) Temperatures during the first half of June were below normal. The coolness retarded the growth of rice but was favorable for wheat and barley.

Yesterday I made a trip through part of the rice area on the east side and a large part of that on the west side of the Sacramento River. Most of the rice crop is late, stands appear to be thin, and a large acreage has been sown on what seems to be old foul land poorly prepared. The late start, thin stands, old land and considerable trouble with scum, indicate that the yields probably will be low. However, it is too early in the season to say that this will be the case.

On many fields on which the water has been held continuously, the stands are poor and a scum collecting on the surface of the water will prevent other plants from emerging even though they are nearly through the water.

Where deep water has been held continuously many young plants are being attacked and killed by leaf miners. Some good stands on the Station have been practically ruined by this insect. Other stands have been thinned out materially.

When young rice is submerged, with from 3 to 6 inches of water in cool weather, it takes the plants 7 to 14 days to emerge through the water, and when the leaf reaches the water surface the plant is apparently too weak to resist the attack of the leaf miners. Plants not weakened by deep water are apparently not attacked or, if attacked, they are not seriously injuried. Today I noted that some of the plants that were apparently dead for several days are sending out a new leaf below the water, so a few plants may recover. But many of the plants have decayed while others are coated with algae so there is little possibility that many can survive.

Some excellent barley and wheat crops were noted yesterday, growing on old rice land. The barley crop near Butte City and in Colusa County looks very well. The barley is practically all mature, escept fields that were sown late, and some of these are very poor.

(July 1) Temperatures from June 15 to 30th were considerably higher than those recorded from June 1 to 15. As a result of the higher temperatures the Station rice, as well as the commercial crop, has materially improved in growth and color.

During the last 15 days in June there were 7 days when the maximum temperature reached 100 degrees or higher. The maximum temperature was 109 degrees on June 25, the minimum 55 degrees on June 22, and the greatest daily range in temperature was 41 degrees on June 18 and 20. The total evaporation for June was 6.843 inches. There was only a trace of precipitation.

All Station rice is submerged and making satisfactory growth. Water grass in the varietal plats is being pulled.

The Rice Growers' Association of California has sold about 350,000 sacks of paddy rice during the past two weeks. Most, if not all, of this has been sold on a basis of $2.75 per hundred for paddy grading No. 1.

University Farm, Davis (V. H. Florell) (July 1) The harvest of the cereal experiments is now practically completed. The unharvested portion consists of several crosses of F_2 hybrid wheat material which are being left out for shattering until the latter part of this month, and also a number of late-maturing varieties in the wheat classification nursery, most of which have been introduced from The Netherlands.

The cereal grains ripened about two weeks later here this year than the usual time at Chico. This probably was due mostly to the cool late season. The winter's snowfall was the heaviest for years both in the Sierra Nevada and the Coast Range mountains. There was much snow left in the high Sierras late in June. The nearby large snowfields must have been partly responsible for the unusually cool spring temperatures. Grain is well filled, however, and a good crop is being harvested on neighboring ranches.

Mr. Merritt N. Pope, agronomist in barley investigations, arrived June 4 and remained until June 20. While here Mr. Pope took notes on and harvested and threshed the varieties in the large barley classification nursery.

Mr. J. Allen Clark, agronomist in charge of western wheat investigations, arrived on June 6 and remained until June 16. Mr. Clark inspected the wheat experiments and took notes on wheat varieties in the identification nursery and the wheat-hybrid nursery. He also harvested the cross which he plans to use for research work at Minnesota University.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, of this Office, was a visitor for several days early in June.

Dr. H. H. Love, professor of plant breeding, Cornell University, was here from June 17 to 24. Dr. Love studied and harvested his wheat-hybrid material consisting of about 1000 nursery rows.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION.)

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Personnel (July 11-20) and Field Station (July 1-15) Issue.

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PERSONNEL ITEMS

The appointment of Alvin A. Anderson, as field assistant in barberry eradication, with headquarters at St. Paul, Minn., effective July 1, 1922, was revoked because Mr. Anderson had accepted other employment.

Reiner Bonde, appointed field assistant in barberry eradication in Minnesota, effective June 5, resigned his position on June 28 to accept an appointment with the Nebraska Department of Agriculture.

E. E. Brown, agronomist in corn investigations, left Washington on July 1+ for Mandan and Dickinson, N. Dak., Moccasin, Mont., Akron, Colo., [illegible] and Manhattan, Kans., and St. Paul, Minn. Mr. Brown will take notes on experimental plantings of corn, do hand pollinating, and harvest corn varieties grown experimentally under short-season, dry-land conditions. Mr. Brown has been given definite headquarters at the Northern Great Plains Field Station, Mandan, N. Dak.

Ralph W. Caldwell and Julian I. Graven have been appointed field assistants in barberry eradication, effective July 12 and July 1, respectively, with headquarters at Brookings, S. Dak.

Earl D. Cornwell was appointed field assistant in barberry eradication, effective July 1, 1922, with headquarters at Urbana, Ill.

George K. Davis and Nathaniel G. Preston have been given appointments as field assistants in barberry eradication, effective July 1, 1922, with headquarters at Madison, Wis.

Frank A. Douglas and Paul L. Hamel have been appointed field assistants in barberry eradication effective July 10 and July 1, respectively, with headquarters at St. Paul, Minn.

Richard L. Harrison has been appointed unskilled laborer, effective July 1, 1922, to assist with cereal and flax experiments conducted at the Northern Great Plains Field Station, Mandan, N. Dak.

Dr. A. G. Johnson, pathologist in cereal disease investigations, visited Westminster, Md., on July 17, in company with Prof. C. G. Woodbury, of the National Canners' Association, and Prof. J. E. Metzger, of the University of Maryland, to inspect fields of sweet corn seriously affected with Stewart's disease, a bacterial affection of corn.

Charles L. Judson has been given an appointment as field assistant in cereal investigations, effective July 1, 1922, to assist with the cooperative experiments in cereal production and cereal diseases at University Farm, Davis, Calif. He will work under the direction of Victor H. Florell.

T. W. Mackie, formerly agent of this Office, has been appointed collaborator coincident with his assumption of full-time duties at the California Agricultural Experiment Station, Berkeley, Calif. As collaborator of this Office Mr. Mackie will continue his interest in the cooperative investigations of stem rust of wheat and oats, leaf rust of barley, and the smuts of wheat and barley.

Harold E. Parmel and Lawrence A. Schaal have been appointed field assistants in barberry eradication, effective July 1, 1922, with headquarters at Ames, Ia.

Robert E. Porter, formerly State leader in barberry eradication in Iowa, has been appointed collaborator of this Office coincident with his assumption of full-time duty as pathologist in the extension division of the State College of Agriculture, at Ames, Ia.

Fred D. Richey, agronomist in charge of corn-breeding and cultural investigations, returned from Knoxville, Tenn., on July 17. He reports that hand pollinating in the cooperative corn breeding plats at the Tennessee Agricultural Experiment Station was well under way on that date. With high temperatures and abundant moisture corn was developing rapidly, and the plats had lost much of the ragged appearance noticeable early in the month.

Jerome P. Seaton has been given an appointment as field assistant in cereal investigations at Arlington Farm, Virginia, effective July 15, 1922.

Clyde F. Shackson has been appointed field assistant in barberry eradication, effective July 12, 1922, with headquarters at Columbus, Ohio.

VISITORS

John C. Hamlin, member of the Australian Prickly Pear Board, of Brisbane, Australia, who is making special investigations in the United States, was an Office visitor on July 10 in order to familiarize himself with the present status of the flag-smut and take-all investigations as conducted by the Department. Mr. Hamlin expressed a desire to cooperate in any way possible when he returns to Australia.

MANUSCRIPTS AND PUBLICATIONS.

Manuscripts.

A manuscript entitled, "Symptoms of the Rosette Disease of Wheat Compared with those Produced by Certain Insect Pests," by Harold H. McKinney, assistant pathologist, Office of Cereal Investigations, and Walter H. Larrimer, scientific assistant, Office of Cereal and Forage Insect Investigations, (Bureau of Entomology), was transmitted on July 12, with a view to publication as a professional paper in the Department Bulletin series. The investigations discussed were conducted cooperatively with the Illinois, the Indiana, and the Wisconsin Agricultural Experiment Stations.

On July 13 a manuscript entitled, "The Influence of Spacing on Productivity in Single-Ear and Prolific Types of Corn," by Ernest B. Brown, agronomist, and Harry S. Garrison, assistant agronomist in corn investigations, was transmitted for publication as a Department Bulletin.

A manuscript entitled "Field Selection of Seed Corn," by Dr. G. N. Hoffer, agent and pathologist in charge of the cooperative investigation of the root, stalk, and ear rots of corn at Purdue University Agricultural Experiment Station, La Fayette, Ind., and Prof. A. T. Wianko, chief in Soils and Crops, of the same Station, was read on July 13, and approved for publication as a bulletin of the Department of Agricultural Extension of Purdue University.

A brief article entitled "Studying Stem Rust of Wheat with Airplanes," was prepared by Dr. H. B. Humphrey, on July 13, for publication in the Official Record of the Department.

A paper entitled "Studies on the Life History of Stripe Rust, Puccinia glumarum (Schm.) Erikss. & Henn.," by Prof. Charles W. Hungerford, agent of this Office, and plant pathologist of the Idaho Agricultural Experiment Station, was submitted on July 15, with a view to puolication in the Journal of Agricultural Research.

A manuscript entitled "The Soft Red Winter Wheats," by Clyde E. Leighty, agronomist in charge of eastern wheat investigations, and John H. Martin, agronomist in western wheat investigations, was submitted on July 20, with a view to publication as a Farmers' Bulletin. This is the sixth and last manuscript in the series covering the six commercial classes of wheat.

Proofs Read.

Page proof of Department Circular 229, entitled "Wild Rice," by Charles E. Chamliss, agronomist in charge of rice investigations, was read on July 13.

Page proof on pages 157 to 238 of Department Bulletin 1074, entitled "The Classification of American Wheat Varieties" was read on July 20. This completes the first page proof of this bulletin.

MEETING OF WESTERN AGRONOMIC CONFERENCE.

The following employees of the Office have been authorized to attend the sixth annual meeting of the Western Agronomists at Pullman, Wash., and Moscow, Idaho, on July 20, 21, and 22: J. Allen Clark, agronomist in charge of western wheat investigations; Jenkin W. Jones, superintendent of the Biggs Rice Station, Biggs, Calif.; Victor H. Florell, assistant agronomist in charge of cereal investigations at the University Farm, Davis, Calif.; David E. Stephens, superintendent of the Sherman County Branch Station, Moro, Oreg.; Clyde W. Warburton, agronomist in charge of cereal agronomy investigations; and Gustav A. Wiebe, junior plant breeder in charge of cereal experiments at the Aberdeen Substation, Aberdeen, Idaho.

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T. R. Stanton, agronomist in charge of oat investigations, writes as follows on July 15, 1922, concerning agricultural conditions in Missouri, Kansas, northeastern Colorado, and Iowa:

Missouri: In central Missouri crop conditions in general were only fair. The oat crop apparently will be very poor. Late seeding followed by dry weather in June was not favorable to it. The straw is exceedingly short and many fields did not look as if they would be worth harvesting. Winter wheat also was injured by the dry weather. Corn is short and "spotted." In northwest Missouri crop conditions were better. Oats, while short, were somewhat better than in central Missouri. Accompanied by Prof. J. H. Parker, of the Kansas Agricultural College, I inspected a number of fields of Burt oats in the vicinity of Cameron, Mo., where it appeared as though practically every farmer grew that variety. This section, like the remainder of Missouri, is not particularly well adapted to oats, and the farmers claim that year in and year out they get the highest yields from the Burt variety. Some good fields of harvested wheat of the Turkey type were observed. A field of an awnless variety similar to Fultz was being grown as Kanred. Corn is well advanced and generally uniform.

Kansas: In eastern Kansas the harvesting of winter wheat was completed and thrashing is in progress. The crop appears good, especially when judged by the large growth of straw and the great number of shocks. In the western two-thirds of the State the crop is reported to be very "spotted." Kansas oats, apparently, have more than maintained their reputation of previous years, and will produce some high yields, particularly where they were sown early. Corn is in good condition and gives promise of a very satisfactory crop.

Colorado: In northeastern Colorado the wheat harvest was just starting. The crop is fair to good. Many fields are reported to be badly infested with bunt, and the opinion prevails among the farmers that late seeding favors the development of this form of smut. Several fields were reported to be so badly smutted that the wheat would be cut for hay.

Iowa: The oat crop in Iowa will be only fair. Some sections report a considerably better crop than last year, but in general the crop is short. Late seeding in combination with a dry, hot June could not produce a big oat crop. Winter wheat is fair to good, but its maturity also was hastened at the expense of yield by the dry weather. Corn generally throughout the State is very promising.

On the Agronomy Farm recent heavy rains and wind storms have caused some lodging in the late oats. The early varieties now are about fully ripe, and will be harvested in the next few days, if the weather is favorable.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report).

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamerly) (No report).

VIRGINIA

Arlington Farm, Rosslyn (Cereal project, J. W. Taylor) (July 13). Threshing operations are well advanced. In general yields of all cereals will be good, with the quality of the grain fair to good. Heavy lodging and rapid maturity lowered the quality of the grain.

Barley yields for 1922 are as follows:

One fortieth-acre test:

Variety	C. I. No.	Bu. per acre.
Wisconsin Winter	2159	50.2
Nakano Wase	2166	36.7
Wisconsin Winter	2167	34.8
Tenkau		34.7
Tennessee Winter		32.2
Han River		30.9
Nakano Wase	754	29.4
Scottish Pearl		20.4

One ninety-sixth acre test:

Selection.	Bu. per Acre.	Selection	Bu. per acre.
No. 27	46.9	Tenn. Winter(check)	39.6
No. 57	43.0	No. 47	37.7
No. 61	43.0	No. 25	36.0
No. 52	40.0	No. 24	36.0
No. 45	40.0	No. 46	36.0
No. 66	39.7	Alaska	35.5
		No. 26	34.0

As in the season of 1921, the experiment with electrically-treated wheat seed gave negative results. Yields were as follows:

One fortieth acre plats: yield in bu. per acre.

Check untreated	Electrically treated	Salt solution	Water treated.
35.7	33.3	29.0	30.2
32.4	32.8	32.8	34.5
33.3	32.5	28.7	27.6
27.7	26.7	23.7	22.3
24.2	24.0	27.2	27.5
Ave: 30.7	29.9	28.3	28.4

Cereal disease project. (July 16)

The harvesting of wheat, oats, and barley in the smut experimental plots has been completed. Because of heavy rains and excessive lodging, the smut records were obtained with considerable difficulty, but it is hoped that they will be as significant as those obtained by our regular methods.

Some encouraging results were obtained with a number of the new mercury compounds. Chloraphol, however, failed to give as good results with spring oats as last year. The results with this compound for the control of barley smuts were good. The data for these various experiments will be summarized within the next few weeks and a complete report will then be made available.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (July 14) During the week of July 10th the weather has been favorable for the ripening of wheat, and harvest has begun. The excessively wet weather during June caused some damage to wheat, and in some parts of the field considerable shriveling has occurred because of scab. The wheat harvest probably will be finished during the week of July 17th.

Some inspection work with wheat, oats, and barley is being done this week and will continue for the next two or three weeks. Rather large seedings have been made from the new varieties of oats in various parts of the State. During the present week Dr. F. P. Bussell, Mr. A. M. Brunson, and Mr. J. R. Livermore are harvesting rye breeding plats in the eastern part of the State and Mr. H. C. Gillis is inspecting wheat and oats in the western part. During the week beginning the 17th these men, together with Dr. H. H. Love, will be busy with harvesting and inspecting, mainly in the western part of the State.

While the rains were somewhat injurious to wheat they have been a great help to oats. We have the most promising oat test we have had in years. We are hoping that the oats will mature before a storm strikes them. Among the new strains being tested are a large number of hybrids between Cornellian and some white-kernelled strains and many of these show up in a very promising way.

The harvest of the wheat hybrids in the garden has been practically completed and the work of taking notes on the oat hybrids will be begun next week.

During the month of June Dr. H. H. Love harvested his hybrids in California and found the material in excellent condition and obtained a good collection for further note-taking during the winter months.

Visitors to the department have been Prof. R. G. Stapledon, of the University of Wales, who spent three days of last week looking over the work of the department, and during the present week Mr. M. C. Rumsey and Mr. F. R. Perry of the Hickox-Rumsey Company, also Dean W. C. Coffey of Minnesota and Professor C. E. Myers of State College, Pa.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (July 11.) The work is progressing very nicely. We have at last succeeded in getting all levees clean and have now commenced weeding plats. It is wonderful how "tea" weeds continue to appear in the plats where no seed has been produced for several years. In one field, I noted some 15 to 20 indigo plants, where no seed had been produced since 1912. It seems that the seeds of this plant remain embedded in the soil, retain their viability when brought to the surface, and germinate very rapidly.

The fertilizer plats are in better condition than ever before, there being nothing to interfere with the securing of good results from the various fertilizer experiments. In fact, all of the rices have a very healthy appearance.

We have had no rain to speak of for several weeks. As a result, the soy beans have been well cultivated. They are in a good, healthy condition and exceedingly clean. About one-half acre has been cut down by rabbits. This damage became less noticeable, however, after the levees were clean.

On a recent visit to Kaplan, La., a large acreage of soy beans was inspected. The largest field contained 260 acres of soy beans in a good, healthy condition. At this season of the year, however, little difference, if any, can be noted where the different kinds of fertilizer have been applied. In fact, I can see no difference. I believe the greatest difference is in the land, for where soil conditions seem the same, I could note no difference in the growth of the plants. Unfortunately, much of the land that was flooded was fertilized with acid phosphate, which has stimulated weed growth and, therefore, has acted to a disadvantage rather than an advantage. I am glad that I made the trip at this time, for the growers were contemplating the purchase of implements for harvesting the beans, and as some of the thrasher companies advocated several kinds of thrashers, there was considerable confusion among those in authority as to which was the best outfit to purchase. I believe that those in authority, as well as the growers, are convinced now that all that is necessary is one or two bean harvesters. If the growers in this locality succeed in harvesting the beans in good condition, and secure a fairly good yield, I am confident that the acreage in soy beans in this parish will be greatly increased next year.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report).

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report).

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report).

Iowa State College, Ames (Barberry Eradication, R. H. Porter) (No report)

(General notes by T. R. Stanton on Iowa conditions will be found elsewhere in this issue of the Courier).

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report).

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root Stalk, and Ear Rots, G. N. Hoffer) (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report.)

Botany Department, Purdue University Agricultural Experiment Station, La Fayette, (Barberry Eradication, K. D. Beeson) (Report for June). The barberry eradication campaign was renewed June 1. with five men employed for this month and two men for fifteen days. Carroll County has been completed, and the survey is under way in Cass, Fulton and Kosciusko Counties. To date in this area 1512 bushes have been found, but none were infected. All of thes counties border those from which the barberry has been removed. Black stem rust infection in this territory has been light. Re-checking has been carried on in LaGrange, Noble, Whitley, Huntington, Steuben, DeKalb, Allen, Wells, Adams and Blackford Counties, and sprouts have been removed. Local epidemics of rust in wheat and rye traceable to the sprouts were found.

All local papers in the regions that are being surveyed, and the press bureaus of the State, have received publicity concerning the relation of the barberry to the black stem rust. All farm bureau members in the territory covered have received material describing the barberry and explaining the campaign against it. Exhibits of the bush and rusted wheat have been placed in public places, and mill men, bankers, and others have been interested in the work.

A rust epidemic near Alert, Bartholomew County, was one of those investigated by the State Leader. A survey in which the county agent and interested farmers assisted showed an area about four miles long and one and one-half [illegible] wide in which the wheat was so badly infested with black stem rust [illegible] of it had not been harvested. Outside this area the rust decreased [illegible] ically disappeared. This is in a rich farming country where the wheat [illegible] e was unusually large, the average from 35 to 100 acres in wheat. Two [illegible] red and fifty acres in this region were completely ruined, and Mr. Elliot, [illegible] farmer, placed the loss at $7,000. This does not include 500 acres, the area in which the grain is a partial loss. A local miller upon examination classed grain from one of these fields as "sample," requiring on a $1.00-per-bushel-basis a 29-cent dockage. A 20-bushel yield estimate in this area would mean a loss of $2,900, thus making the total loss in this region this year about $10,000. The estimate was verified by the local banker who assisted in the survey.

Farmers reported previous rust epidemics over a number of years. Had epidemics of this nature occurred but once in every five years because of rust (epidemics are variable, depending upon climatic and seasonal conditions), the loss during a 60-year period would have been $65,000 with wheat at 50 cents a bushel.

One large 60-year old bush was located in the southwestern part of this infested region and was responsible for the spread on all sides but more especially to the north and east with the generally prevailing winds in this direction, for it was on that side that the infection was heaviest. The leave of the bush were still very heavily infected, and farmers traced previous epidemics to this bush after they learned its relationship to the rust. In 1921 it had been responsible for the rusting of wheat in the fields on both sides of it, so that the grain was largely ruined.

This case against the barberry in this particular locality is similar to those in many localities and illustrates the damage that can be traced to a single bush or to a group of bushes.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (July 15). On July 1 all field men reported for duty. Barberry school sessions were in order the first day. On Monday, July 3, a field trip was arranged for the benefit of the new workers. An area of escaped barberries near West Carrollton was visited. Old bushes, sprouts, and seedlings were found in abundance. Fields of grain were carefully examined to determine the prevalence and severity of black stem rust in the locality. The destructive influence of rust from the barberry bushes in the grain near West Carrollton was very striking this year. The fellows were permitted to discover the facts affecting the problem for themselves.

In order to thoroughly acquaint ourselves with some of the actual problem of barberry eradication, the force was divided on July 5 and grubbing operations started in two escaped areas. During the following four days each man learned that barberry roots are yellow all the way down, and that to completely eliminate the bushes is a considerable task.

On Monday, July 10, four men began survey work in Clark County and four others started in Champaign County. The work in Clark and Champaign Counties is being carried on under the direction of experienced squad leaders. Three men are making the rural survey with the State Leader in Allen and Putman Counties. Two men trained in plant pathology are busy making maps illustrating the spread of stem rust from barberries to grain in various sections of the State. They are also searching for barberries from information received concerning the occurrence of serious black stem rust epidemics. After the harvest these men will give special attention to the mapping of escaped barberry areas.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) No report.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson)(No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report).

GREAT PLAINS AREA (South to North).

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (July 15). Several small showers so far this month have enabled crops to make rapid growth. Threshing wheat seems to be the chief occupation over the country at present.

The broomcorns and sorghums are in good shape and making very rapid growth. The July 1 date-of-seeding experiment emerged to good stand by the 5th. This morning some additional date-of-seeding plats were seeded.

Feterita in the earlier date-of-seeding experiments is heading and the early varieties of sorghums in the varietal experiment are in the booting stage.

Corn varieties for E. B. Brown were sown June 2, four rows to each variety. The San Miguel is showing a few tassels at present date.

Maximum temperature for first half of July, 99° on the 9th; minimum 55° on the 4th. Precipitation for July to date:

0.35 inch July 2	0.56 inch July 7
0.06 inch July 5	0.29 inch July 12
Total . . . . . 1.06 inches.	

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report).

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

(General notes by T. R. Stanton on Kansas conditions will be found elsewhere in this issue of the Courier).

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (No report).

General notes by T. R. Stanton on agricultural conditions in northeastern Colorado appear elsewhere in this issue of the Courier).

Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons) (No report).

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). (No report).

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report).

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (No report).

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (July 11). Field work started in full force July 5 with 15 teams working in six counties of the State. The first three working days of the month were spent in carefully schooling the field assistants in plans and instructions. Four men are working in a county under the direction of one man who is responsible for that county. The work gradually will progress from the southeastern part of the State northward until each county east of the Missouri River is clear of barberries. All barberry bushes found so far have shown heavy infection, but the rust situation in the State is not at all serious because of much cool weather. Much interest and splendid cooperation is manifested by local bankers and farmers in each county.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report).

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayoue) (No report).

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (No report).

Dickinson Substation, Dickinson (Ralph W. Smith) (No report).

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (July 14) The precipitation for the first fifteen days of July was 0.58 of an inch. Precipitation was recorded on the 6th, 8th, 9th, 10th, and 12th days of the month. The maximum temperature for the first half of the month was 89° on July 3 and the minimum 42° on July 6 and 10.

All crops suffered from drouth just previous to a succession of showers. The greatest injury was done on July 3 and the forenoon of July 4. Winter wheat fired considerably, but the recent showers have revived it to a large extent. There are still prospects of unusually high yields provided we do not have more drought. Neither the fall nor spring grain is past danger.

Winter wheat is entirely headed but is not ready to ripen. The earliest varieties of spring wheat are in full head while the later varieties are not yet in the boot stage ically all of the barley and oat varieties are in full head. The flax ies are blooming, but the flax growth is uneven or spotted. Corn was noticeably affected by the drought and it is making a rapid and vigorous owth.

Grasshoppers are fairly numerous near alfalfa fields, roadsides, meadows old stubble fields, or any hard, neglected places, but there has not been muc damage yet. We have spread some grasshopper poison.

Director F. B. Linfield, of the Montana Agricultural Experiment Station, visited the Substation on July 11. C. W. Warburton and J. Allen Clark of the Office and H. L. Westover, of the Office of Forage-Crop Investigations, are expected here tomorrow, July 15.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). (No report).

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report).

(Notes on barley breeding from Merritt N. Pope, July 2.)

I arrived in Aberdeen shortly before noon on June 28. The nursery looked fine and a number of the rows had headed. I just glanced through and saw I'd have to get pretty busy. Many of the breeding project crosses were ready to be made. I have made a lot of crosses on smooth awn and hooded segregates from the crosses Coast and Marlout on smooth awn and on Nepal. The Manchuria crosses will not be ready for a few days yet. Gus and I have emasculated 135 heads averaging better than 13 flowers for the maturation and viability study, and this A. M. I pollinated 33 heads. We will try to finish up the pollinating tomorrow. I have gone over the plans carefully and if we get 9 or 10 seeds per head we will have plenty. Luckily the nursery Hannchen is much later than the plot stuff and we can work on the former if the latter does not pan out. However it looks promising. The pollen was quite plentiful this A.M. and I am hoping for as good fortune tomorrow. We have also tagged about 130 heads for the study of maturation in relation to drying.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (June report)
The weather continued dry, with unusually high temperatures towards the last of the month. The total precipitation was only 0.27 inch, the greatest on any one day being 0.16 inch. The highest temperature recorded during the month was 97°. On July 3, an unusually high temperature of 105° was recorded. This is the highest temperature we have ever recorded at the Station.

The hot, dry weather has ripened the winter wheat prematurely and the yields will be low and the kernels shrunken. The spring grains which have received practically no rain since planting are now suffering for lack of moisture. Some of the early-maturing spring barleys are practically ripe and will give a fair yield. Most of the winter wheats are now ripe, and we started cutting with the binder today.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell)(No report)

Agricultural Experiment Station, Berkeley (W. W. Mackie) (No report).

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.

(NOT FOR PUBLICATION)

Vol. 14. July 31, 1922. No. 17.
Personnel (July 21-31) and Project Issue.

PERSONNEL ITEMS.

Everette L. Campbell has been given an appointment as field assistant, effective July 27, 1922, to assist in barberry eradication, with headquarters at Madison, Wisconsin.

Hugh E. Clark, clerk, was transferred from the War Department on July 17 for duty in the fiscal division of this Office.

Reuben B. Ellestad has been appointed junior analyst, effective July 17, to assist in the ecological and physiological studies of the barberry plant and chemical methods of eradication conducted at Madison, Wis.

Walter C. Leth has been appointed field assistant, effective July 17, to assist in stripe rust experiments conducted at Moscow, Idaho, under the direction of Charles W. Hungerford.

Karl P. Link has been given an appointment as field assistant, effective July 14, to assist in cooperative investigations on wheat scab conducted at Madison, Wis.

Walter O. Lutz has been appointed field assistant, effective July 1c, 1922, to assist in barberry eradication, with headquarters at St. Paul, Minn.

Miss Florence L. Markin has been appointed agent, effective July 14, to assist in barberry eradication, with headquarters at Bozeman, Mont.

Chas. S. Reddy, assistant pathologist engaged in the investigation of bacterial diseases of corn, arrived in Washington July 27 to remain a week or ten days. Mr. Reddy will complete the preparation of manuscripts on certain diseases of corn, brome grass, and rye.

Dr. W. W. Robbins, botanist in charge of investigations of chemical eradication of barberry plants, resigned on July 24 to accept a position as head of the new department of agricultural botany of the University of California, with headquarters at Davis.

Noel F. Thompson, State leader of barberry eradication in Wisconsin has been chosen to succeed Doctor Robbins in the investigation of chemical methods of destroying barberry. Mr. Thompson has had excellent training in chemistry, physiology, and pathology in the University of Wisconsin. He has been closely in touch with the work done by Doctor Robbins, and will be able to carry forward these lines of research effectively and without that danger of loss of results which often arises when a change of leaders becomes necessary. Mr. Thompson's place as State leader will be filled temporarily by Leo J. Federer, an experienced man in barberry eradication, who has been serving as assistant State leader in Wisconsin during the present season.

C. W. Warburton writes as follows from Prosser, Wash., July 24: I have had an excellent conference at Pullman and Moscow and in general a well attended one. Idaho and Washington, of course, were well represented, and Utah, Wyoming, and Montana each sent a man. The only representatives from Califronia and Oregon were our Cereal office men.

I drove across from Pullman to Ritzville yesterday afternoon with Superintendent Bean of the Prosser Station and his wife. We stopped at the Lind Substation this morning, where we had quite a talk with McCall and Wanser. I also saw Donaldson, who, as you know, is now County Agent in Adams Co., Crops generally in eastern Washington are short because of low rainfall, and yields will be low in Adams and other Counties in this section.

This afternoon we drove on down here. Tomorrow I will see the Prosser Station and go on to the Coast. I plant to stop at Puyallup Wednesday and then go to Corvallis, returning to Portland for Sunday and going to Moro July 31. That will make me a day later going to California, but Stephens had planned to be away the last half of this week and naturally I wanted to be at Moro when he was there.

VISITORS.

Dr. Robert S. Woodward, former president of the Carnegie Institution of Washington, was an Office visitor on July 27 to obtain information regarding high-yielding wheat varieties for use on his farm in Montgomery County, Maryland.

Mr. Hung Chun Chang, a recent graduate from Michigan Agricultural College and now en route to Manchuria where he will be connected with the School of Liaoyuan, at Mukden, was an Office visitor on July 27 to get information regarding corn, wheat, rice, and grain sorghums and the diseases of various cereals to be used in connection with his new work.

MANUSCRIPTS AND PUBLICATIONS.

A manuscript entitled "The Role of the Genus Rhamnus in the Dissemination of Crown Rust," by S. M. Dietz, assistant pathologist, was transmitted on July 31 for publication as a professional paper in the Department Bulletin series in cooperation with the Iowa Agricultural Experiment Station.

A manuscript entitled "Cereal Experiments at Chico, California," by Victor H. Florell, agronomist, was transmitted on July 31 for publication in the Department Bulletin series.

A manuscript entitled "Some Graminicolus Species of Helminthosporium L.," by Dr. Charles Drechsler, formerly assistant pathologist in this Office, was transmitted on July 31 with a view to publication in the Journal of Agricultural Research.

CLEARING THE DESK OF MANUSCRIPTS.

In the period from June 30 to July 31, inclusive, covering 26 working days, 18 manuscripts have been read and revised, many of them retyped and read again, the illustrations prepared, drafted, mounted, and described, and all but two of the manuscripts put forward for publication. Of necessity most of the labor has been done outside of official hours. The following list shows the authors and subjects of these manuscripts and the total number of pages covered.

Authors.	Subjects	No. pages.
Stakman et al.	Spores in the upper air	14
Jones, Edith S.	Spore germination of Ustilago zeae	10
Levine	Morphology of forms of P. Graminis	50
Harlan-Pope	Many-noded dwarf barley	5
Rickey	Selection and yield of corn crosses	336
Aamodt	Hybrid wheats and rust resistance	27
Bartholomew-Jones	Infection of oats by loose smut	16
Jones, Edith S.	Spore germination of Ustilago avenae	29
Mahinney-Harrimer	Rosette disease of wheat	16
Brown-Garrison	Spacing and productivity of corn	25
Hoffer-Wiancko	Field selection of seed corn	9
Hungerford	Life history of stripe rust	34
Leighty-Martin	Soft red winter wheats	63
Dietz	Rhamnus species and crown rust	40
Florell	Cereal experiments in California	92
Drechsler	Helminthosporium species	259
Stephens-McCall-Bracken	Dry-land wheat production	121
Hungerford	Hosts and races of stripe rust	58
	Total	824

MANUSCRIPTS IN PRESS.

The Office of Cereal Investigations has 51 manuscripts in press on July 31, 1922. Of these, 10 will appear in private journals and other private publications, and 41 will appear in official channels. Of this number, 40 have been offered for Departmental publication, while one will appear as a State bulletin.

21c-CEREAL DISEASE INVESTIGATIONS

(Dr. H. B. Humphrey, Pathologist in Charge)

21c-A INVESTIGATIONS OF IMPERFECT AND SAC FUNGI.

(Dr. A. G. Johnson, Pathologist in Charge)

Investigations of take-all, other foot rots and wheat rosette.

(H. H. McKinney, Assistant Pathologist)

On June 15, R. W. Webb and H. H. McKinney visited the wheat rosette experimental plats located near Granite City, Ill. At this time the final notes were taken and preparations were made for harvest.

The resistant selection from the Harvest Queen variety still shows 100 per cent freedom from rosette, and the agronomic characters are very good. The wheat is a vigorous grower, stands the winter well, and the heads fill well.

The occurrence of rosette among susceptible varieties was the same as in previous years. The final results of the variety tests will be given later.

On June 16, H. H. McKinney in company with L. E. Melchers visited the farm of Mr. Engle, south of Abilene, Kans., and reinspected a field affected by foot-rot. The disease occurred in spots which were distributed pretty generally over the field. In most of the spots the disease showed up as white-heads and bleached straw with very little blackening at the bases of the diseased plants. In the case of plants attacked earlier there seemed to be more club blackening and mycelial plate development.

Critical examinations of material from this field were made at Madison, Wis., and the mature perithecia of Ophiobolus graminis were found on diseased plants. The pycnidia of Wojnowicia graminis were also found on diseased plants. The latter organism was found to be considerably more abundant than the former.

On June 17 notes were taken on the cooperative experimental plats located north of Abilene, Kans. Probably owing to the unusual delay in the development of foot-rot this year the disease did not occur as regularly over the plats as was the case last year. Under these conditions it was difficult to obtain definite data on most of the plats. In general the disease developed earlier on the lime and gypsum plats. Kanred wheat grown on the first year prairie breaking, adjacent to the infested old wheat land, showed no indication of foot-rot.

Except for a hot spell during heading, the season was ideal for wheat development and very apparently unfavorable to foot-rot development. Careful examinations showed W. graminis present on many of the diseased plants. No O. graminis has been found, however.

On June 18, two series of continuous wheat plats were inspected on the agronomy farm of the Kansas Agricultural Experiment Station at Manhattan. Turkey wheat in one of these plats showed foot-rot in 1921. This year the disease developed in the same spots as in 1921, but the spots were much larger than last year. The disease developed this year for the first time in the second continuous wheat plat. It showed all the symptoms of take-all but no Ophiobolus has yet been found. The pycnidia of W. graminis are fairly abundant, however.

Reports from Corvallis, Oreg., and Spokane, Wash., indicate considerable irregularity in the development of foot-rot in those regions. As yet the final data on the experimental plats located at these places have not been fully obtained.

218 B. RUST INVESTIGATIONS.

(Dr. H. B. Humphrey, Pathologist in Charge)

Stem Rust Investigations.

(Dr. E. C. Stakman, Pathologist in Charge)

Dr. E. C. Stakman, agent of the office of cereal investigations, Bureau of Plant Industry, and plant pathologist of the Minnesota Agricultural Experiment Station has been traveling, since the latter part of May, in western and southern Europe making detailed studies of the occurrence of stem rust in connection with barberry bushes. While Doctor Stakman is primarily interested in getting first-hand information on the eradication of the barberry in certain European countries and the relation existing between the barberry and outbreak of stem rust in Europe, he also is assembling a vast amount of information concerning cereal rusts in general.

Writing from Paris in late May he states that the bushes of the common barberry were then just beginning to show signs of rust. Excursions into the agricultural districts near Paris showed a complete absence of stem rust on wheat and other susceptible hosts. Stripe rust (Puccinia glumarum) already had obtained a vigorous start. No orange leaf rust was noted by Doctor Stakman at this time. In addition to taking a number of short field excursions he had opportunity, while in France, to visit l'Ecole Nationale de Agriculture and to examine herbarium specimens of cereal rusts at the Station de Pthologie Vegetale.

We next hear from Doctor Stakman through a letter written in Barcelona, Spain, on June 10. During the interval between this and the preceding letter he had spent much time in the field, visiting the principal wheat-growing sections of France and Spain. At no point visited did he find stem rust on wheat, oats, barley, or rye. Although there were many barberries, none of the bushes except those near Grignon showed any sign of stem rust.

At Madrid doctor Stakman consulted with Doctor Fragoso regarding stem rust and barberry conditions in Spain. From Doctor Fragoso he learned that the common barberry, Berberis vulgaris, and an indigenous species, B. Hispanica, are responsible for the early appearance of stem rust in spring. At Saragossa he found no barberries and no stem rust. An excursion into the rural envirous of Barcelona yielded similar negative results.

Doctor Stakman reports great interest in breeding and selection of wheat varieties resistant to stem rust, and emphasizes particularly the work of Professor Ducomel at Grignon and Mormant and of Professors Schribaux and Bochâla at Naisy le Roi and Montauban, France, respectively. Promising varieties of wheat resistant to stem rust are being developed by these eminent investigators.

In addition to rusts Doctor Stakman has found the very interesting pietin disease of wheat, caused by Leptosphaeria. One of the striking characteristics of pietin is its tendency to cause full grown wheat to lodge.

A letter dated June 23 tells of Doctor Stakman's departure from Italy for Greece. During his sojurn through the mountains of France, Spain, and Italy he noted thousnads of barberry bushes but found very little stem rust anywhere and that little always associated with the barberry. Authoritative opinion in France, Spain and Italy is one in the belief that, although stem rust does occur remote from barberry bushes, it develops later in the crop season and causes very much less damage than in those sections where the shrub is common. Following his survey of Greece and the Balkan States, Doctor Stakman will proceed to points in western Eurpoe.

Letter from Vienna, July 14, 1922. -

I thought you might be interested in getting a short summary of the barberry rust situation so far. I have sent Dr. Humphrey fairly frequent reports. Recently I have been somewhat remiss on account of the rather unfavorable traveling facilities in the Balkans. From now on, however, it will be possible to travel in reasonable comfort.

The accounts were sent yesterday. I hope they are in good form, although I'm not too sanguine that some corrections will not be necessary. Some of the procedure puzzled me somewhat. Expenses were not as great as I had supposed thay would be, because traveling in Italy and Greece was cheap. Except on the one occasion when I used a wagon lits and except in Spain, we travelled 2nd class which was respectable and confortable although not at all luxurious. In Spain 1st. Class was not esactly what one might desire, even a person with modest tastes.

The barberry and rust situation can be summarized briefly as follows: In France, Spain, Italy, Greece, Jugo-Slavia, Hungary and Austria, Berberis vulgaris is said to be indigenous, and apparently it is. At least it is very common and thrives luxuriantly in the mountains; and European botanists think it is indigenous. However, it is rare in agricultural districts, except in mountains. This is due to the fact that it has been very generally eradicated from most of the regions in which grain is grown extensively - in France as a result of local regulations, in Hungary and Austria by order of the Ministry of Agriculture and by royal decree, respectively. In Spain, France, Italy, Greece, and Serbia there were beautiful demonstrations of the effect of the bushes on

rust. I had to take Fragoso's word for it in Spain, but in the other Countires I saw the finest imaginable demonstrations. In addition to B. vulgaris, B. vulgaris aetnensis and B. cretica are wild and apparently indigenous - the former in the Mediterranean countries, particularly Spain and Italy, and the latter in Greece, within 50 Km. of Athens, B. cretica was very heavily rusted and Hordeum bulbosum, as well as other grasses, were very heavily rusted but only near the bushes. It always has been a source of wonder to me to know just what the situation in Italy and Greece might be, especially on account of the observasions of Pline and the earlier records of Theophrastus regarding rust. It they had the black rust in mind, it is no wonder they saw it. B. vulgaris is very common in the Alps and appenines of Italy and B. Credica is very common in the very region in which Theophrastus lived in Greece. I must say that I think the trip has been very much worth while already; and in England, Denmark and Sweden, also in Germany, I hope to get much more information. I am only sorry that I could not have started earlier, because it has been impossible to travel as fast as I had hoped might be possible.

As far as breeding for resistance is concerned, I think the U. S. Department of Agriculture leads those countries I have visited so far. But apparently Hungary, Austria and Germany have developed cereal seed treatment better than we have in the United States. They use many of the organic mecury compounds which apparently stimulate seed germination as well as prevent rust. These compounds now are being tried in the United States also, as you know. I saw Strampellis plats at Riesi and Ischermak's here in Vienna. Strampelli has a large field, but Ischermak has only a very small garden in the back yard of the Hochschule fur Badenkulter. Both are keeping disease risistance in mind in their breeding work, but they don't distinguish very sharply between the differentekinds of rusts.

It has been rather depressing in Hungary and Austria. Scientists certainly are confrunted with a very trying situation. Even Ischermak now finds it necessary to do outside work in order to support himself. It is impossible to buy supplies or scientific apparatus. Prices have increased several hundred times and appropriations only about 10 times. For instance, a small greenhouse would now cost Ischermak 15,000,000 dronen - in normal times $5,000,000 in our money. Now, however, a dollar is worth 29,600 kronen - yesterday. It is an awful situation for the people in these countries. In spite of the depressing conditions the scientific spirit is keener and the workers seem more enthusiastic than in any other country except France. But you no doubt know the situation perfectly well.

It is nearly train time so I must end this hastily written note. Expect to go to Prague to see Stanch, then to Munich to consult with Hiltner, then to Lurich, to see Foscher, then to Paris, unless the crops are too far along, to see see Schribais' wheats again. Then to England and from there to Germany and Scandimavia, including Denmark. I should like to spend some time in Berlin. Dr. Camillo Schneider, who knows more about Berberidaceae than anyone else in Europe - probably in the world - is there, and I want to go over his collection.

I shall try to send a report every week or ten days, unless it does not seem worth while. I have sent reports to Dr. Humphrey at frequent intervals, and no doubt you have seen them.

It will seem very good to get over to England and get some mail. Have received none so far. I hope you are having a pleasant time this summer and that everything is progressing well.

Barberry Eradication.

By - Dr. F. E. Kempton, Pathologist in Charge.

Progress in barberry eradication, June 30, 1922

By - Dr. F. E. Kempton, Pathologist in Charge.

The campaign has now continued through its fourth complete fiscal year, in addition to the preliminary work done in the spring of 1918. Results for the fiscal year, July 1, 1921 to June 30, 1922, and for the 4¼ years from April 1, 1918, to June 30, 1922, are presented below.

The campaign for barberry eradication was organized in February and March, 1918, by the Office of Cereal Investigations of the Bureau of Plant Industry, United States Department of Agriculture, in cooperation with the following 13 northcentral States: Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming.

A preliminary campaign of education and survey was begun about April 1, 1918, under the emergency appropriation for stimulating agriculture. An appropriation of $150,000 for barberry eradication for the fiscal year ending June 30, 1919, was approved on October 1, 1918. Since that time eradication has been continued in each of the thirteen States.

A federal quarantine was made effective on May 1, 1919, prohibiting the movement into the eradication area of any barberries known to harbor black stem rust of wheat and other grains. All the States either have found that existing laws covered the situation, have passed amendments to them, or have enacted new legislation.

Results from July 1, 1921, to June 30, 1922.

During the fiscal year ending June 30, 1922, the farm-to-farm survey was continued in new territory, and a resurvey was made of the cities and villages in each county covered and a resurvey for sprouts and seedlings was made on properties on which barberry bushes had been located previously in the farm-to-farm survey.

An area equivalent to about 122 counties was completed in the farm-to-farm survey during the year. Of these, 24 counties in Minnesota were surveyed on funds furnished by that State. In the survey 141,251 bushes were located on 4,011 properties. Of these bushes, 64,572 were escaped from cultivation on 471 farms. A total of 151,[illegible] bushes was removed from 4,574 properties. In the resurvey, 55,81[illegible] sprouts were found and eradicated. Numerous seedlings and a number of bushes not removed by the property owners upon first notification also were destroyed.

Investigations have been started from which preliminary results indicate that both mature bushes and seedlings may be destroyed by chemical means. Mature bushes, both uncut and cut off at the ground, and also young bushes and seedlings are being treated at different seasons of the year with various salts, oils, and chemicals that give off destructive gases. Studies are being made of the quantities necessary to apply, parts of the bush that should be treated, and proper time of application of each of the various chemicals. Studies are under way to ascertain the quantity of reserve food occurring in the various parts of the barberry plant at different periods of the year in order to study the relation of such supplies to killing.

Other studies on the rate and amount of penetration of the various chemicals to various parts of plants are being planned. Observations are being made also upon the methods of distribution of barberry plants, soils upon which escaped bushes more often appear, sizes and ages of the bushes appearing in these areas, and the extent of the various areas of the escaped bushes. Maps are being prepared of each area of escaped bushes not only for study but to give directions for finding and eradicating sprouts and seedlings of future resurveys.

In connection with the epidemiology studies of the spread of rust, the State leaders of barberry eradication and their field assistants make observations, collect data, and make maps showing the distribution of infected barberries, the spread of rust from barberries to grains and grasses, and certify as to the presence or the absence of rust in the areas where barberries have been removed or where barberries have not been found to occur.

In cooperation with the forces employed in the study of stem rust and in cooperation with the War Department, airplane flights are made for the purpose of determining if spores of rust are present in the air during the growing season of wheat and the possibility of their being spread by surface winds or upper air cufrents. Leaders and field assistants have made flights from flying fields near Ft. Sill, Oklahoma; Louisville, Kentucky; Dayton, Ohio; Rantoul, Illinois; Omaha, Nebraska; and St. Paul, Minnesota.

Results during four years, 1918 to 1922.

During the period, April 1, 1918, to June 30, 1922, almost all cities, towns and villages in the entire thirteen States of the eradication area were surveyed. The original survey was completed in Montana, Colorado, and Wyoming and a resurvey was begun in these States finding and eradicating sprouts and seedlings appearing since the original survey was completed. The survey is being carried forward rapidly from farm-to-farm and county by county in the other ten States. In the farm-to-farm survey, approximately 330 counties have been covered. A resurvey of every property on which barberries were found is being carried on, and areas in the vicinity of large hedges or large bushes, either cultivated or escaped, which were old enough to bear seeds when found, were designated for more careful resurvey. A total of 5,625,289 bushes was located on 50,287 properties. Of these 3,296,378 were escaped bushes on 2,440 properties.

A total of 4,[illegible]67,[illegible]6 busnes was removed from 46,366 properties. Of the 1,167,651 busnes remaining on 3,921 properties, the greater number is in a few large escaped areas in the States of Wisconsin, Illinois and Michigan. These areas can not be cleared immediately because of their extent and the difficulty of eradication.

Table 1 shows the survey results, by States, for the last fiscal year, from July 1, 1921 to June 30, 1922. Table 2 shows the survey results, by States, for the $4\frac{1}{4}$ period, April 1, 1921, to June 30, 1922.

Table 1. Data showing results obtained in the barberry eradication campaign from July 1, 1921 to June 30, 1922.

State	Number of properties having bushes				Number of bushes.						
	In cities and towns	In country Escapes	Total	Total properties	Cleared of bushes	In cities and towns	In country Escaped	Total	In both cities and country Found	Removed	Sprouts Found and removed in the resurvey.
Colorado	16	5	32	48	42	62	45	262	524	236	580
Illinois	1154	77	247	1,401	1,635	11,975	15,420	22,589	34,564	36,816	947
Indiana	338	27	89	127	146	314	527	2,100	2,414	2,639	1,074
Iowa	17	34	188	205	206	53	2,643	6,765	6,818	6,843	17,844
Michigan	209	30	191	400	480	3,153	13,161	22,674	26,027	21,552	196
Minnesota	61	33	214	275	291	689	2,580	7,301	7,990	7,892	4,418
Montana											
Nebraska	37	14	146	183	174	273	2,404	5,265	5,538	6,231	143
No. Dakota	9	1	45	54	54	149	150	1,579	1,728	1,728	519
Ohio	523	18	184	707	925	2,264	4,051	4,945	7,209	7,090	2,303
So. Dakota	8	24	129	137	83	293	3,231	6,725	7,018	2,924	778
Wisconsin	113	208	351	464	499	401	40,360	41,188	41,589	64,903	4,953
Wyoming	4	0	6	10	39	14	0	18	32	707	56
Total	2,189	471	1,822	4,011	4,574	19,640	84,572	121,611	141,251	159,561	33,811

Table 2. Data showing results obtained in the barberry eradication campaign from April 1, 1918, to June 30, 1922.

State	Number of properties having bushes.				Number of bushes.					
	In cities and towns	In country		Cleared of bushes	In cities and towns	In country		In both cities and country		Sprouts found and removed in the resurvey
		Escaped	Total Properties.			Escaped	Total	Found	Removed	
Colorado	1,508	23	105	1,613	1,607	19,197	1,455	3,425	22,622	22,534	3,517
Illinois	7,767	347	803	8,570	8,120	92,666	25,652	42,638	135,304	122,227	2,336
Indiana	3,151	57	485	3,636	3,616	75,428	4,209	13,805	89,233	86,847	2,980
Iowa	6,684	208	1,030	7,714	7,706	642,544	32,266	89,871	732,415	732,020	23,893
Michigan	3,874	905	3,626	7,500	5,600	39,360	76,960	131,917	171,277	120,722	258
Minnesota	2,787	219	1,027	3,814	3,795	588,801	53,536	152,984	741,785	741,476	15,904
Montana	152	1	43	195	194	6,577	1	2,105	8,682	8,671	4,515
Nebraska	2,979	21	287	3,266	2,929	71,298	3,241	12,493	83,791	82,994	3,284
No.Dakota	479	1	156	635	635	14,171	150	3,398	17,569	17,569	821
Ohio	4,528	65	561	5,089	4,451	197,231	19,774	25,753	222,984	201,260	2,534
So.Dakota	383	66	296	679	603	22,230	14,412	23,871	46,101	40,340	2,311
Wisconsin	5,966	526	1,521	7,489	7,055	276,832	3,064,722	3,072,554	3,349,386	2,279,817	13,630
Wyoming	74	1	13	87	57	3,946	1	194	4,140	1,161	256
Total	40,334	2,440	9,953	50,287	46,366	2,050,281	3,296,378	3,575,008	5,625,289	4,457,638	76,239

5. PRELIMINARY REPORT ON THE USE OF CRUSHED ROCK SALT (SODIUM CHLORIDE) IN KILLING THE COMMON BARBERRY.

By - Dr. W. W. Robbins, Botanist.

This preliminary report is issued because of the many questions that are being asked continually by farmers and others as to the value of salt in killing the barberry. Salt is a readily available chemical, relatively cheap, easily applied, and not injurious to man or stock. It has been used by many individuals to destroy the barberry, but we have no records of the amount used per bush and of the final results.

In the experiments cited below, rock salt, crushed, furnished by the Morton Salt Company, Chicago, Illinois, was used. This material usually comes in 100-pounds and 200-pound bags, and costs about $6.25 per 1000 pounds, f.o.b. Chicago. The same material can be purchased locally of ice-cream manufacturers, or feed stores, at a slightly higher price.

The separate sets of experiments were conducted, namely, A. Field experiments in the autumn of 1921; B, Greenhouse experiments in the winter of 1921-1922, and C, Field experiments in the spring of 1922.

A. FIELD EXPERIMENTS IN AUTUMN OF 1921.

a. Woodlot at Gurnee, Illinois.

The bushes treated varied in height from 3 to 5 feet. Many of them were several feet across at the base. They stood in an open woodland pasture. The salt was applied dry. Not exactly the amounts named were applied to each bush. Some received less, some more, depending upon the size of the base. The quantity named is the average application per bush. Common salt goes very slowly in solution under the conditions as applied in the field. In the case of the 16-pound and 28-pound applications cited above, salt crystals were to be found about the bushes as late as May, 1922, and this in spite of the snows of winter and rains of spring. The effectiveness of the chemical may be due to this very fact, for it is doled out slowly over a long period. The plan and results are shown in table 1.

Table 1. Scope and results of an experiment in treating bushes with crushed rock salt, in a woodlot at Gurnee, Illinois, on October 31, 1921.

Method of Treatment	Number of bushes	Average quantity rock salt per plant	Average cost per plant for salt	Average cost per plant for labor	Total cost per plant
		Lbs.	Cts.	Cts.	Cts.
Bushes cut at ground line, salt applied to stump.	47	8.5	6.9	1.28	8.18
Bushes not cut, salt applied at base.	37	16.2	13.2	1.08	14.28
Bushes not cut, salt applied at base.	14	28.0	22.9	2.12	25.02

Results: Not a single one of the 90 plants treated has shown any growth activity up to the date of last observation, July 11, 1922. A number of the plants have been dug and the root systems examined. The roots are dead to varying distances from the crown, usually from 10-18 inches. The growing tissue of all stems is dead, as is evidenced by its dark color.

b. Hedge near Marshall, Wisconsin.

The bushes treated were from 10 to 13 feet tall and about 30 years old. The bases were from 10 to 18 inches in diameter, as the bushes stood closely crowded in a hedge. Salt was applied dry.

Table 2. Scope and results of an experiment in treating bushes with crushed rock salt, in a hedge near Marshall, Wisconsin, on October 31, 1921.

Method of Treatment	Number of bushes treated	Average quantity rock salt per plant	Average cost per plant for salt	Average cost per plant for labor	Total cost per plant
		Lbs.	Cts.	Cts.	Cts.
Bushes cut at ground line salt heaped about stump.	25	8	10.0	2.2	12.2
Bushes not cut, salt heaped about crown.	18	11.1	13.8	2.0	15.8

Results: Up to the date of the last observation, July 8, 1922, not one of the bushes showed any growth activity. The stems, crown and (in the few cases examined) roots, to distances varying from 10 to 18 inches from the crown, are dead.

B. GREENHOUSE EXPERIMENTS IN THE WINTER OF 1921-22.

Salt was applied dry to barberry plants in large pots, at rates representing rates of 10 lbs. and 5 lbs. per average plant as they occur in the field. In the first case, the plants were dead in ten days after the date of application. The plants had a bleached appearance, and in one case, there was an accumulation of salt crystals at the lenticel openings.

C. FIELD EXPERIMENTS IN THE SPRING OF 1922.

a. Woodlot, at Gurnee, Illinois.

The bushes treated varied in height from 4 to 8 feet. Many of them were several feet across. They stood in a fairly open woodland pasture.

Table 3. Method and results of treating barberry bushes in a woodlot at Gurnee, Illinois, with crushed rock salt on April 27, 1922.

Method of Treatment	Number of bushes treated	Average quantity rock salt per plant	Average cost per plant for salt	Average cost per plant for labor	Total cost per plant.
		Lbs.	Cts.	Cts.	Cts.
Plant cut at ground line, salt applied to to crown.	20	5	4.1	1.5	5.6
" "	20	10	8.2	2.0	10.2
" "	20	15	12.3	2.5	14.8
Plants not cut, salt applied at base.	20	5	4.1	1.0	5.1
" "	20	10	8.2	1.5	9.7
" "	20	15	12.3	2.0	14.3

Plants with tops cut at ground line. On June 3, a few green shoots had made their appearance on two bushes treated with 5 pounds each. On June 9, all bushes except the two mentioned still were free from sprouts, and on July 11 this was still true.

Plant not cut. By May 10, all plants showed signs of marked injury. On June 9, all but two of those receiving five pounds a piece were devoid of green leaves; two of the bushes receiving ten pounds showed a few green leaves; and all bushes receiving fifteen pounds per plant had top growth apparently entirely dead. On July 11, the top growth of all bushes given 10 and 15 pounds, respectively, was apparently entirely dead, while 3 bushes, to which 5 pounds were applied, showed some green leaf tissue.

GENERAL CONCLUSIONS.

Necessarily, conclusions at this time must be tentative, especially as applying to bushes treated in the spring of 1922. However, we feel quite safe in recommending at this time the use of crushed common rock salt as a fall application to destroy the barberry. Treatments of bushes cut down at ground line, and of bushes left standing, are apparently equally effective. The average-sized bush can be cut down very quickly in the following manner. One man throws a rope about the base of bush, one to three feet from the ground, and pulls the bush over, while a second person cuts the stems at the ground line with several strokes of the axe. It often is easier to apply salt effectively to the stumps of a bush than to a standing bush. Also, there is less wastage of chemical. Moreover, berry-producing bushes removed in late summer and fall should be cut down and destroyed. Consequently, in the fall treatments it usually will be advisable to cut the bush at the ground line before making the application of salt. Apply the salt dry, placing it on the crown and out to a distance of about one foot.

The quantity to apply to each bush will depend as much upon the size of crown and number of stems as upon the height and age of the plant. To the bush of average size, 4 to 7 feet tall, with 3 to 8 stems, forming a crown 6 to 10 inches in diameter, apply 10 pounds of salt. To smaller bushes apply somewhat less than ten pounds. To larger bushes apply somewhat more than ten pounds. Dense clumps of barberries present another problem. Here the salt should be distributed to cover the separate crowns, the quality to each being dependent upon its size.

Even though results of the spring applications of salt look favorable at the present time, but we are not yet ready to make any definite recommendations concerning its use during spring and summer. The above recommendations apply to fall applications.

6. SPRAYING BARBERRY SEEDLINGS.

By - Dr. M. W. Rockwell, Botanist.

The following spraying tests were conducted on barberry plants which had developed from seed and varied in age from a few days to three years. In certain situations where fruiting bushes have been abundant, there are numerous seedlings covering the ground so thickly that their eradication by grubbing becomes a difficult and expensive procedure. The use of chemical sprays promises a cheap and effective method of eradication as is shown in the following brief report.

Experiments in the Autumn of 1921.

On September 29, 1921, a number of areas, each one rod square, and containing numerous seedling barberries, were staked off. The seedlings were growing in great abundance. The site of the plots is a rather steep, stony hillside, with an open oak forest cover, but with little undergrowth. The areas were sprayed with different chemicals, applying them with a pressure sprayer.

In order to determine the effect of the treatments on the young plants, 200 plants in each square rod were pulled, in a strip across the area, taking all plants as they came. This was done on May 2, 1922. The results are presented in table 1.

Table 1. Results of autumn spraying of seedlings and young plants of common barberry, on Sept. 29, 1921, with various chemicals as shown by survival of plants of different ages, recorded on May 2, 1922.

	Number and percentage of plants dead (based upon 200 plants)									
	Plants from seeds germinating in 1921.				Plants from seeds germinating in 1919 or 1920				Dead plants of all ages.	
	Dead		Alive		Dead		Alive			
	No.	%	No.	%	No.	%	No.	%	No.	%
Water-gas drip oil	142	86.6	25	13.2	5	15.2	28	84.8	147	73.5
Oil containing piridine (No.2)	108	85.7	18	14.3	20	27.0	54	73.0	128	64.0
Creosoting oil (No.5)	94	65.3	50	34.7	6	10.7	50	89.3	100	50.0
Fuel oil (No.1)	112	84.8	20	15.2	18	26.5	50	73.5	130	65.0
Dip oil (No.4)	136	79.4	36	20.6	4	14.3	24	85.7	140	70.0
Gas oil (petroleum)	181	90.5	19	9.5	0	0	0	0	181	90.5
Gas oil (petroleum)	174	100.0	0	0	14	53.8	12	46.2	188	94.0

Experiments in the Spring of 1922.

The areas used in these spraying experiments are each one yard square. They are located on the same hillslope as those of the 1921 experiment. The results are presented in table 2.

Table 2. Results of spring spraying of seedlings and young plants of common barberry, on May 15 and June 6, 1922, with various chemicals as shown by survival of plants of different ages

Chemical	Number of seedlings at time of spraying.		Number alive on date when count was made.	
	Seedlings of 1922	Seedlings of 1920 or 1921	Seedlings of 1922	Seedlings of 1920 or 1921
	1. Sprayed May 15, 1922; results recorded June 6, 1922.			
Gas oil	210	8	4	0
Light cresote oil	91	32	0	0
Crude carbolic	220	35	0	0
Water-Gas drip oil	98	26	0	3
Orthotoluidine	65	16	0	0
Kerosene	320	17	0	6
Salt (NaCl)	34	12	7	6
Sodium arsenite	40	70	0	0
	2. Sprayed June 6, 1922; results recorded July 17, 1922.			
Orthotoluidine	67	42	0	0
Water-gas drip oil	340	34	0	3
Light creosote oil	20	59	0	0
Crude carbolic	52	12	0	0
Sodium arsenite (1:30) ½ spreader	54	62	0	3
Sodium chloride ½ spreader	42	36	0	11

Note: ½ The spreader used was "Kaso". Add less than one teaspoonful to each gallon of solution.

Apparatus Used.

We have used the three-gallon brass Lowell Fountain Compressed-Air Sprayer, manufactured by the Lowell Specialty Company, Lowell, Michigan. When filled the sprayer weighs about 35 pounds. The pump produces a fine mist spray. Pressure can be maintained by pumping three to four times while emptying the sprayer. Some of the oils used are destructive to rubber. Use only a good grade of tubing. In using the sprayer, see that all hose connections are tight. Keep nozzle well cleaned. Do not get dirt or fine threads of any material into the chemical, as they are forced into the nozzle and very quickly clog it.

Costs.

Tests of the various materials used show that there is little variation in the amount required to spray a unit area. One gallon of each of the above chemicals will cover approximately three square rods. One filling of the three gallon size sprayer, therefore, is sufficient to cover nine square rods. It requires from six to ten minutes to apply one gallon. The costs of the most effective materials are as follows:

(1) Water-gas drip oil, 20 cents per gallon. This may be obtained at local gas works. The product varies considerably in quality. The best material is light in weight, free from tar, and with a very penetrating and lasting odor.

(2) Gas oil (petroleum), 7 cents to 10 cents per gallon. This may be obtained from oil refineries.

(3) Light creosote oil, 15 cents per gallon. Barrett Company, Chicago, Illinois.

(4) Crude carbolic acid, 35 cents per gallon. Barrett Company, Chicago, Illinois.

(5) Orthotoluidine, 20 cents per pint (pound). Gary Chemical Company Gary, Indiana.

(6) Sodium arsenite, 4 cents per gallon of solution. A concentrated sodium arsenite solution may be obtained from United States Smelting, Refining & Mining Company, Salt Lake City, Utah, at $1.25 per gallon. One quart of this material is mixed with 30 parts of water.

(7) Sodium chloride, 3 to 4½ cents per gallon of solution. Rock salt, crushed, furnished by the Morton Salt Company, Chicago, Illinois, can be secured at a cost of $6.25 per 1,000 pounds, f.o.b. Chicago. It comes in 100-pound and 200-pound bags. Salt may be purchased locally of ice-cream manufacturers, or feed stores at a slightly higher price. Use three pounds of salt to one gallon of water.

The costs of chemicals needed to spray one square rod are as follows:

Water-gas drip oil	6.7 cents
Gas oil	2.3 - 3.3 cents
Light creosote oil	5.0 cents
Crude carbolic acid	11.7 cents
Orthotoluidine	53.3 cents
Sodium arsenite	1.3 cents
Sodium chloride	1.0 - 1.5 cents

One man can spray 18 square rods in an hour. At a rate of 40 cents per hour for labor, the labor cost of spraying one square rod is about 2.25 cents.

Conclusions.

A number of different chemicals apparently are about equally toxic to barberry seedlings. Young plants are more easily killed than old ones. Spraying seedlings of the current season during early summer is almost 100 per cent effective, using any one of a number of different chemicals. A comparison of the use of the same chemical in fall and spring spray treatments shows the fall application to be less effective. Apparently, the seedlings gain in reserve strength as the season advances. These facts suggest the advisability of spraying the young plants as soon as possible after their germination of barberry seeds is in the spring and early summer. However, there is some germination throughout the growing season, up to the time of fall frosts.

218-D SMUT INVESTIGATIONS.

(Dr. W. H. Tisdale, Pathologist in Charge.)

Smuts of Wheat, Barley, and Oats.

Very encouraging results have been obtained by the treatment of wheat, barley and oats with mercury compounds for controlling smuts and increasing the stands in the field. Chlorophol and some of the other mercury compounds, including a few of those put out by the Corona and the DuPont people, show marked effect in the germination and growth of seedlings.

The increased germination is greater with wheat and oats which have been treated with these compounds. They have a slight stimulative effect on barley. Chlorophol has given good results in the control of smuts of all three of these grains, not including the loose smut of wheat, however. It gave better results in controlling both smuts of barley than any other treatment used, and the yield records which were taken by Mr. J. W. Taylor show that in this season, at lease, barley treated with it outyield that given other treatments. The following average yields were obtained:

Barley.

Seed Treatment	Acre yield in Bu.
Smutted and untreated	47.6
Formaldehyde	52.5
Hot water	47.2
Chlorophol	57.6
Copper carbonate	51.8

Copper carbonate did not control the smuts of barley satisfactorily. Formaldehyde and hot water gave almost as good control as did Chlorophol, but the yields were not so good, perhaps due to the fact that a certain amount of seed injury was caused by them.

Copper carbonate proved to be the best treatment for the control of bunt in wheat. The control was just as satisfactory as that obtained by the use of the copper-sulphate-lime dip, and somewhat better, perhaps, than that from Chlorophol. The yields, however, according to Mr. Taylor's records, show copper carbonate to be superior for treating wheat. The following average yields of wheat were obtained:

Seed Treatment	Acre yields in Bu.
Smutted but not treated	21.8
Formaldehyde	30.7
Chlorophol	31.1
Copper-sulphate-lime	32.1
Copper carbonate	33.0

The wheat plants in the plots treated with copper carbonate showed some indications of stimulation during growth.

The records from the Winter turf oat treated with these compounds have not been finished but good control was obtained by the use of formaldehyde and Chlorophol, while copper carbonate was not quite so satisfactory. The yield data obtained so far indicate that yields will be slightly better from plots treated with Chlorophol.

A number of mercury compounds, including Chlorophol, Uspulun, Corona Nos. 10 and 20, DuPont No. 12, and S. D. Nos. 1 and 2, gave good results in the control of smuts in Kherson oats sown in the spring. Chlorophol failed, however, to give as good control of smuts on Chinese hull-less oats as it did last year. This seed was smutted very heavily, however, and perhaps this accounts for the lack of satisfactory control. In all other cases it has given good results.

Corn Smut.

A continuation of the testing of varieties and selfed strains of corn for their behavior toward infection by corn smut is showing encouraging results this year. This work was started last year in cooperation with Mr. Kyle and Mr. Holbert of this Office, and some good results were obtained from their numberous strains last season. This year the varieties are being furnished by Mr. Kyle, Mr. Richey, and Doctor Melchers, of Kansas, and it is thought also that we will be able to obtain records from Mr. Holbert's plots again. The records obtained from his plots last year seem to indicate that there is considerable correlation between the quantity of root and stalk rots and the quantity of smut developed in the varieties. The plot on which these strains are being grown at Arlington Farm was thoroughly infested artificially with spores at planting time. About two weeks ago the plants were inoculated with conidia from cultures obtained from a number of sections of the country. At present some of these strains are showing as high as 75 per cent smut while others remain apparently smut-free. An effort is being made to obtain cultures of smut from various localities throughout the country in order to increase the chances of obtaining virulent strains which will insure a more thorough test of the plants when artificially inoculated. It is hoped that other corn breeders will join in the cooperation in an effort to have every hybrid and selection of corn thoroughly tested for its behavior towards smut before finally recommending it to the farmers.

B. P. I. Library

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14. August 10, 1922 No. 10.
Personnel (August 1-10) and Field Station (July 16-31) Issue.

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PERSONNEL ITEMS

Burton B. Bayles has been appointed junior plant breeder, effective August 7, to assist Prof. John W. Parker in cooperative cereal breeding at Manhattan, Kans. Mr. Bayles graduated from the Kansas State Agricultural College last June, and previously had been an assistant in the breeding nursery. It is expected that he will go later to the Hays Branch Station to assist Mr. Swanson, and will take charge of the work at that point when Mr. Swanson leaves for post-graduate study next September.

Arthur A. Bryan, formerly employed in corn investigations, has been reinstated as scientific assistant under date of July 15, and assigned to duty with Mr. Jenkins at the Iowa State Experiment Station. He is a graduate in agriculture at the University of Missouri in 1915, and was employed in the former office of Corn Investigations during 1916 and 1917. From this position he was transferred to the Office of Western Irrigation Agriculture, and was in charge of the San Antonio Experiment Farm in Texas until February 24, 1920, when he engaged in farming for himself.

Nathaniel R. Carmichael, assistant to the State Leader of barberry eradication in Iowa, has been transferred to the Washington Office to assist Dr. F. L. Pompton in the general conduct of the eradication campaign in the North-Central States. He is a graduate of Iowa State College in 1916, and has served in two previous seasons in the Iowa Campaign, acting as Assistant State Leader in 1921, as well as in 1922.

A. C. Dillman, agronomist in charge of flax investigations, spent the last few days of July and the first few days of August on a trip through Minnesota and South Dakota, studying flax experiments and consulting with experiment station officials, and visiting localities where flax is grown regularly in a mixture with wheat. He will return to his headquarters at Fargo, N. Dak., on or about August 15, after visiting the experiment farms at Sheridan, Wyo., and Moccasin, Mont.

Reuben B. Ellestad has declined his appointment as junior analyst to study the occurrence and location of food reserves in different portions of the barberry plant, and the appointment has been revoked.

Dr. Harry V. Harlan, agronomist in charge of barley investigations, returned on August 6 from a study of barley varieties in New York, Ontario, and Prince Edward Island, with especial reference to the identification of the varieties grown commercially and experimentally in this northeastern portion of the barley-growing area of North America.

Willard L. Hart, who has been under temporary appointment as field assistant for services with Dr. Tisdale at Arlington Farm, has completed the work for which he was appointed, and tendered his resignation effective August 10.

Miss Georgia M. Haughey has been appointed clerk (stenographer-typewriter) to assist Walter F. Reddy, State leader in barberry eradication in Michigan, effective August 5.

Dr. A. G. Johnson, pathologist in charge of imperfect and sac fungi, made a flying trip to New Haven and Milford, Conn., on August 8, in company with Dr. C. G. Woodbury of the Bureau of Raw Products Research, National Canners' Association, and Charles S. Reddy of this Office. They carefully inspected many fields of sweet corn being grown for seed purposes in that portion of Connecticut, with reference to the possible spread of various diseases through infected seed. Dr. Johnson returned to Washington on August 10.

Mark A. McCarty, who has been serving as field assistant in barberry eradication in Minnesota, has resigned effective August 3, to return to his position as Instructor in the University of Minnesota.

Harold H. McKinney, assistant pathologist in charge of investigations of foot-rot diseases, has been spending a few weeks in the laboratories of Dr. Koloid at the University of California, in an endeavor to solve some of the puzzling problems in connection with certain infections which resemble mosaic diseases. He was accompanied by Dr. Sophia Eckerson, formerly of this Office, now representing the University of Wisconsin and the Thompson Institute for Plant Research. Mr. McKinney left Berkeley on August 5, to visit the take-all infections in Oregon and Washington on his way back to Wisconsin.

Ava E. Martin has been appointed field assistant in barberry eradication for services in Illinois, effective July 24. She will assist Mr. Curran in the office at Urbana.

Merritt N. Pope, agronomist in barley investigations, who has spent several weeks in a study of the material in the barley nurseries at the Aberdeen Substation, Aberdeen, Idaho, completed his work there in the last week of July, and now is studying barley varieties on the stations from Montana to University Farm, St. Paul, Minn., where he will arrive on August 7.

Charles S. Reddy, assistant pathologist, engaged in the investigations of corn diseases at Bloomington, Ill., has completed the preparation of two manuscripts, and left Washington on August 6 with Dr. Johnson to visit sweet-corn fields in Connecticut on his way back to his headquarters.

Fred D. Richey, agronomist in charge of corn investigations, will leave Washington on or about August 13 to visit cooperative or independent agronomic and pathologic investigations of corn in Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska.

Milford W. Schueler, who has been serving as field assistant in barberry eradication in Wisconsin since July 1, has resigned, effective July 31, to accept a position with the First-Trust Joint Stock Land Bank of Chicago.

Miss Stephanie Skirman, of Massachusetts, has been appointed stenographer in the Washington Office, effective September 1.

John A. Trumbower has been appointed field assistant in barberry eradication in Iowa, effective August 1.

William A. Walker has been appointed field assistant in barberry eradication to succeed Mr. Noel F. Thompson as State Leader of barberry eradication in Wisconsin. He was a graduate of the University of Wisconsin in 1918, and has since been engaged in farming and teaching.

MANUSCRIPTS AND PUBLICATIONS.

Page proof of Indiana Extension Circular No. 108, entitled,- "Selecting Seed Corn In the Field" by Dr. G. N. Hoffer, Pathologist of this office, and Prof. A. T. Wiancko, Agronomist of the Indiana Station, was read on August 2.

The Annual Report of this Office to the Chief of the Bureau, prepared with a view to publication in his Annual Report, was submitted in sections on August 5 and August 9. Much high-grade research has been in progress during the past fiscal year, and many definite and valuable results have been achieved.

Galley proof of Department Bulletin 1116, entitled "Seedling Blight and Stack Burn of Rice and the Hot-Water Seed Treatment," by Dr. W. H. Tisdale, pathologist in charge of smut investigations, was read on August 10.

ERRATA.

On page 176, issue of July 20, in line 4 of the paragraph on Kansas, for "Kansas oat," read "Kanota oat." In line 2 of the paragraph on Colorado, for "infested," read "infected."

On page 188, issue of July 31, for the number of pages in the manuscript by Mr. Richey, read "36," not"336."

LETTERS FROM WILLIAM FARRER

During the period from July 6, 1894, to April 3, 1906, inclusive, there were received by Dr. B. T. Galloway, chief of the former Division of Vegetable Physiology and Pathology, and Mr. M. A. Carleton, cerealist in charge of the Office of Grain Investigations, a large number of very interesting letters from Mr. William Farrer, plant breeder on the Department of Agriculture of New South Wales. During his period of service Mr. Farrer developed a large number of named varieties of wheats suitable for different sets of conditions in Australia. Of these, Federation probably has been most widely grown and is best know commercially. Bobs is another of his well-known varieties. From the visits of Australian students to this country, and particularly from conferences with Mr. James P. Snelton, now Plant breeder of the Dept. of Agriculture of New South Wales, and last year graduate student in genetics at the University of Minnesota, it developed that Mr. Farrer had left only fragmentary records of his breeding operations. It is believed that these letters contain a more complete record of the crosses he made, the methods he used, and the results he obtained than are on file in Australia.

In view of these facts it has seemed desirable that the original letters should be returned to Australia. Accordingly the letters, which are written in a very fine and somewhat difficult script, have been accurately deciphered and typed. The originals and one copy have been returned for use of the Department of Agriculture of New South Wales and will furnish the students there an illuminating and inspiring record of achievement under difficult and oftentimes disappointing circumstances.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). (No report).

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly) No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor) (July 26) Thrashing of grain in the plat experiments was completed this week and the rod row work is well along towards completion. Weather conditions have been unfavorable for thrashing and extra work in handling the grain in the field was necessary.

The yields of winter oats for 1922 are as follows:

Variety	C.I.No.	Bu.per A.	Variety	C.I.No.	Bu.per A.
Kanota	830	70.3	Culberson Sel.273-1-14		61.3
Bicknell Sel.206-155		69.8	Winter Turf - sel.435-4		60.5
Dwarf Culberson	746	66.9	Black	838	59.9
Fulghum	708	68.7	Winter Turf Sel.541-4		59.7
Fergusons Navarro	966	64.2	Winter Turf	431	57.0
Red Rustproof	1815	62.9	Aurora	831	56.0
			Culberson	273	53.2

The above represent the average yield of three one-fortieth acre plats, with the exception of the check, Culberson, C. I. 273, which is the average yield yield of 13 plats. Fulghum and Kanota appeared identical throughout the growing season and their yielding ability appears similar. In two of the three series Fulghum outyielded Kanota. The Winter Turf oats which appeared most promising two weeks before harvest were undoubtedly injured by the hot spell which hastened maturity. Many immature kernels were present.

New oat varieties or strains tested in single fortieth-acre plats gave the following results:

Variety	Bu. per A.	Variety	Bu. per A.
B-74	66.4	B-75	51.4
B-73	57.2	Culberson Sel.273-41	50.0
Hutchinson's Lil.C.I.947	55.5	Black C.I.691	41.3
1901 f1-1B	55.0	Hardy Rustproof	40.2

B-73 and B-74 are hybrids with Winter Turf characteristics and appear to be promising.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (Aug.8) The cereal nursery has all been harvested except a few oats that are being grown for classification material. The drill plats and increase plats of oats and barley have not yet been harvested and have been considerably injured by storms. It is questionable whether yields from the oat plats will be at all comparable.

The threshing of wheat and rye has been begun and it is hoped to have the yields of our wheat and rye experiments available for the next report.

The work on the new storage and threshing shed is practically completed and this building is proving of great service to us in handling our work.

The harvesting of the oat hybrids is about half completed and the work will be continued for a week or ten days yet.

Since the last notes sent in, there has been a considerable amount of field inspection of oats and barley made thruout the State. Dr. F. P. Bussell, Mr. M. C. Gillis, Mr. J. R. Livermore, Dr. C. H. Myers, and Dr. H. H. Love have given considerable time to this work. On account of the harvest coming so close together in the different parts of the State it was necessary to use more than the regular force and Dr. Myers found it possible to leave his own work long enough both to help in New York State and to do inspecting of the new barleys and Cornellian oats as well as Victory oats in Michigan, Indiana, and Illinois. The crops from these fields are to be used for seed purposes and we though it desirable to make the inspection. In addition to the inspection work a number of the oat and barley experiments in different parts of the State also have been harvested. This year we have ten tests of oats in nine different counties and several barley tests.

Visitors interested in cereal work have been as follows: M. C. Rumsey and F. R. Perry of the Hickox-Rumsey Seed Company, Batavia, N. Y.; L. P. Gunson, G. L. Gardner, and Geo. K. Higbie, seedsmen of Rochester, N. Y.; and Dr. H. V. Harlan, agronomist in Charge of barley investigations in the Cereal Office. Dr. Harlan also accompanied those doing inspection work in different parts of the State.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report).

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (Aug. 2) The last two weeks in Missouri have been favorable for crop growth. Local showers have been common over the State and a heavy rain which fell July 28 and 29 provided the corn crop with enough moisture for all present needs. Corn is in excellent condition and all except the late planted corn in the northern part of the State has passed the silk and tassel stage.

Our breeding corn on the Station field is doing well and pollination will be practically finished within another week. Except for the loss of a considerable number of plants in the storm which accompanied the heavy rains last week, this breeding corn is in excellent condition, as is also all other corn on the Station field.

Samples of threshed grain of wheat and oats are now being tested for seed approval and the first list of approved seed will be mailed tomorrow. Over 112,000 acres of grain, mostly wheat, was inspected for seed this year but a large proportion of this will not be approved. Mixture of varieties was the most common cause of disapproval. Smut was not common this year, practically no stinking smut being found.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (Aug. 1). This is the first opportunity I have had to catch up with office details for nearly four weeks. I have made approximately 2,000 hand pollinations, selfs and crosses, and will begin taking individual plant notes and gather material for leaf spot studies this week. Since July 11 the work has been continuous, week-day and Sunday, early and late. The weather during most of this time has been very hot, unusually so for this locality, I am told.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report).

Iowa State College, Ames (Barberry Eradication, J. H. Muncie) On July 1 a conference of all the field men on barberry eradication was held at Ames. Talks and instructions were given by Dr. I. E. Melhus, extension director, R. K. Bliss, R. H. Porter, former State leader, and J. H. Muncie. The men left at once for their temporary field stations.

The following counties have been surveyed so far this season: Kossuth, Winnebago, Hancock, Webster, Wright, and Humboldt. One new area of escaped bushes was found on July 14 near Garner, in Hancock county. The area consisted of about five acres of neglected, cut-over timber. The barberries were present as seedlings, sprouts, and old bushes. All seemingly have originated from a hedge along one side of the woods.

ILLINOIS

Post Office, Urbana, (Barberry Eradication, G. C. Curran) (Aug. 5). An all day conference of the entire field force was held on June 30 in Urbana. July 1 field work was started, Four teams, consisting of four men each, with automobiles were placed in Jo Daviess, Ogle, Carroll and De Kalb Counties. In Cook County three foot-scouts did city survey work the first part of the month. On July 22 another field man was placed in this County increasing the force in that County to four.

In Jo Daviess County a number of escaped areas have been located. As the topography of this county is very rough and hilly, in some places the bushes are growing in rocks and crevices and eradication is exceedingly difficult. The survey work in Carroll and Ogle Counties has progressed very slowly, due to the fact that the land in these counties is rolling and hilly. Also most of the timber land has to be scouted on foot. In De Kalb County the country is much smoother and the survey work much easier.

The following table summarizes the work of original survey for the month of July:

County	No. of Escaped Bushes found.	Total No. of Bushes found	Total No. Bushes removed.
Carroll	2	303	33
Cook	0	1016	745
De Kalb	1	328	325
Du Page	0	2	2
Jo Daviess	43	676	302
Kane	1	3	2
Lake	0	89	2
Livingston	1	169	166
McHenry	1	12	12
Ogle	14	272	241
Stephenson	0	24	24
Will	0	3	3
Champaign	0	13	8
Totals	63	2910	1832

An interesting case of barberry law enforcement which was started more than a year ago by the Illinois State Department of Agriculture in the Police Court in Rockford, Illinois, came up for action in the Circuit Court of Winnebago County on June 22. A letter from Lewis F. Lake, Clerk of Circuit Court in regard to this case is as follows:

"In compliance with your request am enclosing a certified copy of the final order in the case of the People of the State of Illinois, vs Mrs. George Ellis, General No. 25774. Term No. 136, showing the conviction of the defendant and assessment of a fine of $10 and costs.

The case was an appeal from Burton W. Norton, police magistrate, following her arrest and conviction in police court on a charge of failure to remove common barberry after being notified to do so by the Department of Agriculture. A fine of $25.00 and costs was assessed in police court but when the appeal was reached in circuit court, the State's attorney and counsel for Mrs. Ellis agreed to have the Court find the defendant guilty and assess a fine of $10.00 rather than try the case again, the chief cause of complaint from the police court being apparently the size of the fine rather than the conviction. The costs from justice court, and from our Cout with the fine included brought the total amount which Mrs. Ellis was compelled to pay to $29.40."

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert). (Aug. 4). We have just completed our hand pollination season with a total of more than 3200 pollinations. Many selections in our best self-fertilized strains show considerable improvement over last year. Some of them, in fact, are apparently quite resistant as determined by plantings in soil that has been cropped with corn for four years. The first generation hybrids that attracted attention last year are even better this year.

On July 10-12 Mr. Holbert inspected cooperative experiments that are being conducted in Knox and Peoria counties. The experiment on time of planting and soil treatment in Knox county, which is being conducted cooperatively by the Brotherhood of the Ontario Parish, the Knox County Farm Bureau, and the Office of Cereal Investigations is especially interesting. All the experiments in both counties had received very careful attention. In Knox County many commercial fields were inspected that had been planted with seed selected according to recommendations in Farmers Bulletin 1176. The uniformity, vigor, and freedom from disease symptoms were outstanding characteristics in every case. Mr. Bracker, the county agent, and his farmers, are enthusiastic over the results they are getting by following the recommendations for field selection, physical selection, and germinator selection.

Mr. Koehler visited our cooperative experiments at the Illinois Agricultural Experiment Station on July 13 and 14. Several photographs were taken of the outstanding results in the rotation, time-of-planting, and soil treatment studies.

On July 17 Mr. Koehler inspected our cooperative experiments in Macoupin county.

Mr. C. S. Reddy left for Washington on July 26 for consultation regarding manuscripts that are nearing completion.

Visitors during the last month were:

Jean Lekeu, of Belgium;
Dr. W. L. Burlison, University of Illinois.
Dr. C. G. Woodbury, Washington, D. C.
Mr. Smalley, of the National Fertilizer Association;
Dr. Whiting, University of Illinois; and
Mr. Merle T. Jenkins, of the Cereal Office, who is Stationed at the Iowa Agricultural Experiment Station.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer). (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains). (No report).

Botany Department, Purdue University, Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson).

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (July 31) The Barberry survey in Springfield and vicinity presented the usual tedious big-city problem. A great portion of the city is heavily lanscaped with ornamental shrubbery. Eighty-six old locations were revisited and one hundred fifty one new plantings were found within the city limits. The survey of the smaller towns and rural districts of Clark county has been in progress for a week. A general bid for stem rust and barberry leads was made through a circular letter to members of the Clark county Farm Bureau. One tip received in response netted us six rural locations and an obvious solution of the stem rust trouble in that neighborhood. In the half of Clark county, covered by the rural survey in July, one escaped area of about fifty bushes on three farms, was discovered.

The southeast quarter of Putnam county was surveyed, the last half of Allen was finished, and the southern half of Logan was completed during July. Champaign county also was entirely covered. Work is being started in eastern Clark, northern Logan and Harden counties.

Miami county has been completely covered by a resurvey for sprouts, including Piqua, with two hundred sixty locations, during the past month.

Rock salt was placed on many sprouts in the Lewisburg, Preble County, escaped area. Many big, old bushes and hundreds of seedlings were removed from the woods near West Carrollton, Montgomery County.

Two field men have spent considerable time recently making maps illustrating the spread of black stem rust to wheat from barberries. This year the field force has been one hundred per cent successful in finding barberries in the immediate neighborhood of every badly rusted wheat field found to date.

The evidence against the barberries, in Ohio, is so strong that we challenge any farmer to show is grain badly infested with black stem rust where we cannot find the barberries.

Mr. Sandhammer, the Agricultural Agent in Champaign county, estimated the damage from black stem rust in his county this year at one hundred thousand dollars. That is far more than twice as much money as the barberry campaign has cost in Ohio since its initiation in April, 1916. It is gratifying to know that practically all the stem rust damage in Champaign county has been traced to barberries. When a group of Champaign county thrashers were approached on the subject of barberry eradication the field men were surprised and delighted when a farmer exhibited his own demonstration sample of common barberry. While working in Champaign county, field men crossed into adjoining counties six times in response to insistent demands from farmers, to investigate the cause of rust trouble. In every case the cause was traced to barberries.

Less territory has been gone over in the rural survey, during July, than was expected but we would rather list, "Barberry bushes found," on the right side of our ledger than to record, "Square miles covered."

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (July report). The first two working days of July were spent in conference endeavoring to master the fiscal regulations and discussing field work. Lectures upon black stem rust were given by Dr. Bessey and Dr. Hesler. All available slides picturing details of barberry eradication were shown. The men went forth confident that they had mastered all phases of the work expected of them this summer and their confidence was justified in so far as their field work was concerned, but on July 14 and 15 the midnight oil was burned in getting expenditures to fit into the fiscal regulations. All expense accounts left the polls on time; no casualties reported to date, but no one has raced into the money.

We have eighteen field assistants divided into three squads. Each squad has three cars and we are working three adjacent counties at one time. About eighty per cent of Calhoun County was completed during the last part of last season's work; one squad located at Battle Creek and completed the Calhoun survey; another squad located in Van Buren County and the third in Berrien. By the 5th of August the farm to farm survey will be completed in Calhoun, Kalamazoo, Van Buren and Berrien Counties.

The squad which located in Battle Creek secured rooms in a private home and this proved to be a great advantage over quartering in hotels. We expect to follow the idea of securing accommodations in private homes as far as possible during the balance of the season.

Practically every barberry located has been heavily infected with stem rust and we were expecting a regular epidemic of rust if weather conditions were favorable. Fortunately, in so far as the rust is concerned, we had an exceedingly dry spell and Michigan is not seriously struck by the rust this season. Wherever we found barberries in a community which had local showers during the last part of May up to the middle of June, the presence of rust was extensive in that area.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (July report). On the first of July, ten teams of two barberry scouts each and eight foot-scouts were put into the field in the State. As the State had 10 teams of two men each already in the field this increased the barberry eradication force to forty-eight men. Southeastern Minnesota was the point of attack. A thorough check resurvey was started in Freeborn County. With this force, one hundred thirty-eight plantings containing three thousand two hundred forty-eight bushes were found during the month and one hundred twenty eight plantings containing three thousand two hundred eight bushes were destroyed. One thousand six hundred fifty-one bushes were found escaped on nine properties in four countries. Seven thousand seven hundred sixty sprouts and seedlings were found on resurvey.

There was an escaped area of about fifteen acres of barberry bushes found north of Pine Island. The bushes were eradicated in one day, by means of a "barberry eradication bee," composed of farmers in the surrounding neighborhood. The grain was severely rusted in this community so the farmers had good reasons to assist in the work. Another "bee" will be held shortly at Spring Valley at which the Governor of the State, the President of the Farm Bureau and other influential men will assist. Moving pictures will be taken of this bee by the conference for the prevention of Grain Rust.

Barberry demonstrations were put on at fifteen county fairs during July, and similar demonstrations have been booked up for eighty-six county fairs during the season.

(August 3) The work is progressing very well at the present time. It is my conviction this year, more than ever, that the barberry is responsible for the serious epidemics of stem rust in this State. You, perhaps, have seen some of the reports of the observations which have been made this year.

I would like to state that the formation of the Conference for the Prevention of Rust has proved a great aid to the campaign. The publicity which they are giving the campaign is excellent. They are getting in touch with everybody. To cite one instance - - Mr. F. S. McCabe, Agricultural Agent of the Chicago, Minnesota, St. Paul and Omaha Railway is distributing actual specimens of the common barberry to every station on that system in Minnesota, South Dakota, Iowa, Nebraska, and Wisconsin. The agents of this system are not only putting specimens in the depots, but are also supplying the tanks, elevators, and other strategic places. To date, he has received at least six mail sacks full of specimens and the farmer who owned the large planting recently found at Pine Island, hauled a whole hay rack full of sprigs for consignment to Mr. McCabe. He has not yet received a sufficient supply, so I am instructing all of the scouts to send him as much specimen material as possible until further orders.

The type of survey work this year, presents more difficulty problems than that of previous years, due to the fact that the type of county which is being surveyed is wholly different from that surveyed in previous years. Southeastern Minnesota, as you perhaps know, is very rough and wooded in places. Common barberry has been planted there for at least 70 years. However, we are covering every inch of the ground, and it is surprising to note the isolated places where bushes are found growing as escapes.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (Aug. 1). Though good rains have been reported in practically every direction from Woodward, there has been none at the station or town during the last part of July. All growing crops will be damaged by the drought and should no rain occur soon the kafirs and milo will be very poor grain crops this year. It is astonishing however, how the sorghums can appear as green and turgid as they do in the mornings.

The earlier varieties, feteritas, Early white milo, and Freed sorgo are all headed and will make fair grain yields, the earlier kafirs are starting to head and will be damaged by drought, milo is making boot in the varietal plats. Though it is too early to be certain, the indications are that the early-maturing varieties will make the best yields this season. However, nothing was gained by seeding milo or kafirs before the middle of May as they will yield practically nothing, there is still a fair chance for the later sowings of milo and kafir to make fair yields should rains come within the next 2 or 3 weeks.

Work on the project has been keeping up notes and bagging heads as they emerged to get good seed for another year. Various sorghum hybrids in the F_2 generation are giving interesting results already.

Corn certainly looks like a failure on the station this season, though there is a slim chance for the later varieties to make seed, depending on rain to come.

One reason for the July drought being so noticeable this year was the fact that there was no rain in June (0.16 inch). Also, from July 21 to 30, inclusive, the maximum was over 100° F. each day.

Maximum temperature, 107° on the 22nd; minimum, 64° on the 20th. Precipitation 0.01 on the 24th. Total for July 1.07 inches, occurring in 3 showers.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (July 25)

Kansas Weather and Crop Conditions in May.

Weather during the first week in May was favorable for wheat. Rain fell on several days. Corn planting was nearing completion in the south-central counties, but not more than 10 to 25 per cent of it was planted elsewhere. Alfalfa has been especially favored by the weather of the last few weeks.

During the second week in May conditions were ideal for wheat except that in the eastern half it made too rank a growth. The crop was heading in the extreme southeastern counties. Rapid progress was made with corn planting and alfalfa harvest was begun in the southeastern counties. Planting grain sorghums and Sudan grass was begun in the central and southwest counties.

During the third week in May, soaking rains fell in nearly all parts of the State which totalled from 1 to 3 inches. Temperatures were close to normal and there was an abundance of sunshine. Wheat was heading rapidly in the southeastern counties. Corn planting was practically finished. The weather was especially favorable for pastures and alfalfa.

Cloudy and rainy weather prevailed most of the fourth week of May over the eastern half of Kansas and wet fields slowed up farm work considerably. Rains in many of the eastern counties totalled from 1 to 2 inches. The weather was much too wet for wheat in the eastern half of the State where this crop made too rank a growth and lodged to some extent on low ground. Stands of corn were generally reported as good. Oats and barley showed a general improvement. Pastures were fine.

Kansas Weather and Crop Conditions in June.

During the first week in June, splendid crop growing weather prevailed. Rains fell in the western half of the State totaling from one-half inch to almost two inches. Wheat was heading in all of the eastern two-thirds of the State. Further damage was reported from lodging and some damage from chinch bugs in the south-central part of the State. Oats were heading. Corn had come up to good stands and grain sorghums were mostly planted and coming up well.

The second week in June was the driest and hottest of the season in Kansas. No measurable rain fell except local showers in a few eastern counties. Temperatures of 90 to 95 degrees were general. Wheat ripened rapidly in all sections and the hot weather caused some shriveling of the grain. Temperatures were favorable for corn, grain sorghums, broom corn, and Sudan grass. Barley was reported as doing well in the northwestern counties, but oats were reported as being in only poor to fair condition in the eastern third of the State.

During the third week in June temperatures above the mid-summer normal prevailed over most of Kansas and the north half of the State was almost dry, but a number of counties in the southern half had rains averaging about one inch. Weather was entirely too hot for wheat, which, in many central and northern counties, ripened prematurely with consequent shriveling of the grain. Corn was reported as generally in good condition, but the hot weather was very unfavorable for oats which had a late start and was short.

During the fourth week in June, the drought over the eastern third and most of the central portion of Kansas was broken by splendid soaking rains which totalled from 1 to 3 inches. Temperatures were considerably above normal but reached 100 degrees in only a few places. Corn was greatly benefited by the rains. The hot weather of the week was detrimental to wheat that had not matured. Oat harvest followed wheat harvest closely. Grain sorghums were reported as generally in good condition although their growth was somewhat slowed up by the dry weather. Pastures were also dried up by the drought.

May Weather at Manhattan.

Weather data for the month of May at Manhattan are as follows: Total precipitation, 3.70 inches, measurable precipitation on 13 days. Maximum temperature 93° on May 5, 9 and 29. Minimum temperature 40° on May 19.

June Weather at Manhattan.

Weather data for June at Manhattan are as follows: Total precipitation, 3.32 inches which all fell on three days and of which 2.51 inches fell on one day. There was no rain from June 1 to 26. Maximum temperature 99° on June 29; minimum temperature 44° on June 2.

Kansas Crops; Acreage and Production Estimates for 1922.

The report of the Federal Statistician issued June 11 forecasts a production of 109,000,000 bushesl of winter wheat; 94,000,000 bushels of corn; 30,000,000 bushels of oats; 14,000,000 bushels of barley; 23,000,000 bushels of grain sorghums; 1,000,000 bushels of rye; and 4,000,000 bushels of potatoes in Kansas this year. The Kansas corn acreage was estimated at about 5,000,000 acres, an increase of 15 per cent over 1921. The corn crop was reported as being about ten days to two weeks below normal in development.

Many fields of oats were ripened prematurely by the June heat and the total yield probably will be about 9,000,000 bushels less than that of last year. Barley also was prematurely ripened by the hot weather of June, and as ususal many fields were also hurt by chinch bugs. The acreage of sorghums grown for forage purposes, including both saccharine and grain sorghums for the silo, is estimated as 774,000 acres, an increase of 17 per cent over last year. Much of this increased acreage is on abandoned wheat land in the western half of the state.

Misc'l Notes from the Kansas Station.

Dr. H. V. Harlan spent two days at the station in May, J. Allen Clark was here for two days early in June, and J. H. Martin was at Manhatten from June 22 to 24. Mr. Martin also visited the substations at Hays and Colby.

The writer met T. R. Stanton at Cameron, Mo., where a field trip was made for the purpose of studying and collecting samples of Burt oats. This variety was brought to Cameron, Mo., from Tennessee by a native of that State in 1869 and has been continuously grown since that time. H. O. Pixlee, a grain dealer at Cameron, has been largely responsible for the distribution of Burt oats in his territory. He has encouraged farmers to grow it and has sold much of the crop on the St. Louis market for seed. The variety is said to do as well as any other variety in good oat years and produces a fair yield in years when other varieties produce little or nothing. A large number of heads were secured which will be grown in head rows at Manhattan in 1923.

Rains late in June and in July have interfered to some extent with nursery harvest and threshing. Most of the rod rows were harvested by July 4 and it is expected that threshing of winter wheat will be completed on July 22. Kanota oats (Kansas Fulghum) was very late to head and to ripen in the nursery. Apparently late planting of this variety causes it to have a long growing period. The same variety planted at the normal date at the Agronomy Farm produced from 70 to 75 bushels per acre. The yields in the nursery will be very much lower.

The Kansas Crop Improvement Association inspected Kanred, Turkey, Kharkof, Blackhull, Harvest Queen, and Fulcaster wheats and Kanota oats for about 250 growers. The field inspection work has been completed and a list of certified seed has been printed and distributed. It is estimated that about 50,000 bushels of inspected seed of Kanota oats will be available for planting in the spring of 1923. The total quantity of seed required to plant the usual oat acreage in the state is in the neighborhood of 3,000,000 bushels. It is estimated that about 150,000 bushels.
of inspected seed of Kanred wheat will be available for planting this fall. The approximate amount of hard winter wheat required for seed is 6,000,000 bushels. The Association plans to do more extensive work in the field inspection of corn and sorghums this fall and is also in a position to accept applications for the field inspection of sweet clover, sudan grass, alfalfa, and other crops

The following prices for seed wheat and seed oats have been suggested by the Association:

Wheat (Kanred, Turkey, Blackhull, Harvest Queen and Fulcaster)

Recleaned in seamless cotton sacks, f.o.b. station, sacks included, in less than 50 bushel lots	$2.25 per bu.
Recleaned in seamless cotton sacks, f.o.b. station sacks included, in lots of 50 bushels or more	2.00 per bu.
Recleaned in jute sacks in carload lots, f.o.b. station, sacks included	1.75 per bu.
Not recleaned on farm or not recleaned in carload lots, f.o.b. station	1.40 per bu.

Kanota Oats.

Recleaned, sacked, and treated for smut, f.o.b., station, jute sacks included	1.35 per bu.
Recleaned, and sacked but not treated for smut, f.o.b. station, jute sacks included	1.25 per bu.

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S. C. Salmon is spending a two weeks vacation in South Dakota.

L. E. Call left Manhattan July 20 and will spend two days at the Garden City substation and about a month with President H. L. Kent of the New Mexico College in revising their book on Kansas agriculture.

C. O. Johnston is spending two weeks vacation at his home in southern Kansas.

A new teaching laboratory for crop improvement classes and other advanced courses in farm crops is being provided by a division of one of the farm crops laboratories.

Mr. Carl Bower is now engaged in selfing corn in the corn-disease plots.

The sorghums were all thinned in June and are making a good growth; the milos however have been severely damaged by chinch bugs.

A tractor demonstration was held at the Agronomy Farm on June 19 when eight or ten different companies had their machines and representatives on trial and exhibition.

Notes on Cereal Diseases furnished by - Professor L. E. Melchers.

There were no reports of a general occurrence of stem rust in the state. Leaf rust developed to some extent, but was not prevalent enough to cause serious injury. One of the most prevalent foliage disease of wheat this year is the Septoria leaf-spot. It was present in many fields, being particularly conspicuous on the lower leaves. Some varieties are showing a great deal of infection, however, and the indications are that differences in susceptibility will be found. On May 15 Blackhull wheat showed more infection than any other variety observed. It appears that this disease caused some injury. Notes on varietal susceptibility were taken this year in view of the fact that this disease was more prevalent in Kansas than ever before noted.

The wheat foot-rot problem in Kansas probably was more serious this year than last. The disease showed up in a number of plats at the agronomy farm and in the experimental plats and commercial fields in Dickinson and Leavenworth Counties. A very extensive cooperative project is being conducted in Dickinson County, about 14 miles northwest of Abilene. About five acres of land is being devoted to this project. The work in progress includes varietal date-of-seeding, rotation, plats, and soil amendment and fertilizer plats. Special attention was given to the possible relation of grasses to the wheat foot-rot problem. Organisms which have been isolated are being studied in the laboratory.

In the corn germination work in connection with the studies of corn root-rot and corn smut, some interesting results have been noted on the prevalence of certain organisms. The following organisms have been present in a large number of isolations made from the table germinator: Fusarium moniliforme, Gibberella saubinetii, and Diplodia. The first is by far the most common, while the two latter organisms were present to the extent of 1 to 2 per cent. This brings out certain points in connection with the Kansas problem which require careful study and indicate that factors are concerned which are different from those in other States. It has been observed for years that wheat scab is a neglible factor in Kansas. A large number of strains of inbred corn have been planted, in addition to strains secured from Dr. W. H. Tisdale and from the Connecticut and Indiana experiment stations. Special studies will be made in connection with the possible existence of biologic strains of corn smut. Artificial inoculations will be made by using strains of corn smut obtained from different States.

Extensive studies are being made of the various treatments for the control of sorghum-kernel smut. Sorhgum-smut treatment plats are located in 15 different counties in Kansas. Some of these fungicides are: Chloronol, Seed-O-san and the Corona mercuric bichloride products. Similar studies are being made

on oat smut. Observations will be made on the increased vigor and yield from seed which has been thus treated. About 175 rows of smut-resistant oat selections which were artificially inoculated with smut were grown in the agronomy nursery. These plantings are of strains of oats which have been artificially smutted for three seasons but which have not shown infection.

Hays Branch Experiment Station, Hays (A. F. Swanson) (July 15). Threshing operations are well started. Oats and spring wheat are already threshed. The oats will average around 30 bushels to the acre while the yield of spring wheat will run from 15 to 20 bushels to the acre. Considerable rain early in July delayed harvest. The weather is now dry and windy. Early sorghums are just beginning to head.

(July 31) We have had no rain during the last fifteen days. The maximum range of temperature has been from 99 to 104. The temperatures for July 21 and 28 were 104 and 101, respectively. The dry weather was favorable for threshing, which was completed July 21. The rowed crops have suffered to some extent from the drought, and rain is now needed.

The following acre yields of hard winter wheat were obtained this season from fiftieth-acre plats replicated four times:

Variety	C.I.No.	Bu.	Variety	C.I.No.	Bu.
Kanred		16.0	Crimean	1436	11.0
Blackhull		14.5	Turkey	1580	10.5
Station No. 6	6467	14.4	P 1066		10.5
Local Turkey		14.4	Nebraska No. 60		10.0
Nebraska No. 6		13.5	Pioneer Turkey (Local)		9.8
P 1066		13.1	Defiance Hard Winter		9.5
Alberta No. 6		13.1	Kharkof	1563-30	9.4
Roumanian		12.8	Iowa No. 1946		9.0
Kharkof	1563	12.5	Kanred		7.1
Kharkof	1442	12.5	Finland		5.3
Improved Turkey	5592	12.0	Hybrid No. 128 (Wash.)		3.0
Malakov	2906	11.4			

Kanred's lead in yield may be partly due to its freedom from rust. Blackhull was early enough to escape the rust epidemic which was more apparent this year than usual, due to the late maturity of the wheat. All of the yields recorded above are from wheat which came up between March 20 and 25.

The yields for the three soft winter wheats were as follows:

Nebraska No. 28, 16.3 bushels;
Harvest Queen, 12.4 " ; and
Forrester, 9.9 " .

Nebraska No. 28 was the only winter wheat which lived through from the fall-sprouted stand.

Two replications each of the following spring grains were grown in fiftieth-acre plats and the following yields obtained:

SPRING WHEAT

Common	Bu.	Durum	Bu.
Prelude	19.4	Acme	22.9
Hard Federation	18.6	Kubanka	20.2
Pioneer	17.5	Mariout	17.5
Marquis	16.7		
Preston	16.5		
Kota	15.6		

SPRING BARLEY

White Smyrna	45.6	Stavropol	36.7
Blacknull	44.0	Meloy	36.0
Calif. Mariout	43.3	Gatami	35.9
Flynn	42.8	Himalaya	35.4
Beloi	42.8	Hannchen	34.9
Mariout	42.6	Odessa	34.9
Coast	40.6	Svanhals	32.3
Trebi	40.5	Manchuria	28.1

SPRING OATS

Burt, Kans. No. 5219	59.8	Albion	50.8
Fulghum, C.I. 706	59.0	Sixty-Day	49.6
Burt, Kans. No. 5020	57.1	Nebraska No. 21	46.1
Kanota	55.4	Kherson	42.9
Aurora	54.7	Burt x Sixty-Day	41.8
Red Texas	54.3	Iowar	35.6
Richland	51.9		

All of the above yields are subject to correction as they have not yet been rechecked. Yields for the cultural methods will be given at a later date.

The sorghums are now heading and considerable time is required in taking notes and bagging individual heads. Genetic notes are being made of about 1000 plants of a cross between Dwarf yellow milo and Pink Kafir. Half of the sorghum nursery is grown on fallow ground and half on cropped ground. The part grown on fallow ground is withstanding the hot weather in good shape.

Thirty acres of wheat land on the cereal project are under cultivation for the 1922 crop. Ten acres are in fallow, 10 acres in early summer plowing, and ten acres in summer listing. The summer plowing and listing were completed in July and this ground is in excellent condition to take in any rainfall from now until seeding time.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). (July 31) The past month has been a very busy one at Akron Field Station. Harvest of small grains started about July 10, and with the exception of a few scattered plats and nursery rows of late maturing varieties, was completed during the three-week period following. As a rule, fair yields have been obtained from those fields

where soil-blowing did not reduce the stands too severely last spring. Many of the fields in this section will probably yield between 15 and 20 bushels to the acre, and in the more favored localities yields in excess of 20 bushels have been harvested from some fields.

Weather conditions during the month have been comparatively favorable. Many local showers were received during the latter half of July. Some section have been visited by severe hail-storms, but the areas hailed out have not been as great as in some previous seasons. While the local showers have only visited small areas, nearly all sections have been receiving sufficient moisture to insure at least an average crop of corn and other row crops. Corn is nearly fully tasseled and sorgo is heading rapidly at the present time.

Work on the Akron station is well abreast of the season. Unless rain makes it impossible, thrashing of the small grain plats and increase fields will probably start the first week in August. At the present time, the fields are soft and the grain water-soaked from a driving local shower of more than one inch which visited this section last week. The grain will probably not be dry enough to thrash well before about August 5. Although the region in which Akron Field Station is located was none too well supplied with moisture during the heading and ripening stages of the cereals, it appears likely that some of our better plats will produce fair yields. Many of the Cereal Investigations plats of winter wheat will probably yield 30 bushels or better; a few may thrash yields of close to 40 bushels. The better plats of spring wheat will probably yield about 20 bushels, and the best plats of oats and barley will very likely produce yields of between 35 and 45 bushels. Stands in the winter wheat nursery were very thin in many rows due to soil-blowing. The spring wheat nursery was cut short by dry weather. As a whole, however, the nursery yields will be above the average for this station, and in general the seasonal results from the Cereal Investigations small grain experiments are probably as satisfactory as have been obtained on the Akron station since 1915. Most of the corn on the station is now fully tasseled and silked. The sorghum crops are heading very rapidly and with an abundance of moisture in the soil conditions point to a very satisfactory crop of corn and sorghum on the Akron station in 1922.

During the past month the Akron Field Station has been favored by visits from the following men: Mr. J. A. Clark and Mr. John H. Martin, of the western wheat investigations, Mr. T. R. Stanton of the oat project, and Mr. M. N. Levine of the rust investigations project of the Cereal Office; and by Supt. John M. Stephens of the Menden, North Dakota, and Mr. John Kelso of the Ardmore, South Dakota, stations of the Dry-Land Office. Mr. J. Russell Smith of Columbia University, New York, also visited the station during the month. Mr. E. B. Brown of the dry-land corn investigations project, arrived at Akron on July 25. He is very busy selfing and crossing a large number of corn selections and probably will not leave Akron until some time during August.

Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons). (July 31) Considerable progress has been made this month in re-checking the barberry plantings that have been located in this State up to date, and in surveying certain areas more carefully.

Our force this month has consisted of three men, each working separately in automobiles. The area surveyed or re-checked consists of sections of Adams, Denver, ElPaso, Fremont, Jefferson, and Weld counties, and all of Larimer

county. Re-checking has been carried on both in the rural districts and cities of Adams, Denver, El Paso, and Fremont counties.

The original survey of practically all portions of the State necessary to survey was completed last year. Our chief interest this year has been to destroy the sprouts from the bushes already removed. Certain areas have been more carefully surveyed, and some interesting data accumulated. In the two northern counties rechecked: namely, Larimer and Weld counties, the following results have been obtained. In Larimer county 116 properties have been located on which 1300 common barberry bushes were growing. Of these, 213 bushes were found sprouting on 35 properties, or, in other words, 16.3 per cent of the bushes in this county produced sprouts on 29.5 per cent of the properties. In Weld county, 62 bushes were found sprouting out of a finding of 842 bushes, located on 18 out of 95 properties. This gives 7.4 per cent of the bushes sprouting on 18.9 per cent of the properties. In the south-central part of the State, in El Paso and Fremont counties, slightly different results were obtained. El Paso county had 268 bushes sprouting out of 3637 bushes, located on 27 out of 214 properties, or a percentage of 7.6 of the bushes sprouting on 12.6 per cent of the properties. Fremont county had 696 bushes sprouting out of 1912 bushes, located on 19 out of 62 properties, or a percentage of 36.5 of the bushes sprouting on 30.6 of the properties.

The data for Adams, Denver, and Jefferson counties was not compiled this month because these counties have not been finished. For the four counties already completed we have found an average of 16.3 per cent of the bushes sprouting on 20.2 per cent of the properties.

In Fremont county south of Canon City, along the shores of the reservoir and the ditches of the DeWeese Dye Ditch and Reservoir Company, 598 seedlings were removed which had germinated from seeds that were in the ground for two years. Of this finding, however, only two plants were found infected, and these very slightly.

Throughout the State the season has been very unfavorable for rust development up until the last few weeks. However, of late we have been having light showers followed by hot weather. This has been true more in the southern part of the State than in the northern part. In the northern counties, by far the greater part of the grain, both winter and spring varieties, is beyond danger. Ten to thirty per cent rust infection has been found thus far in this territory and that, on late Marquis growing in low places such as swamps and along the rivers. The field assistants report that 75 per cent of the wheat is being harvested and the remaining grain is ripening very rapidly.

In the southern part of the State the light showers and the hot weather have combined to make conditions much more favorable for rust development during the last three weeks. Reports coming into this office show that as high as 50 per cent rust infection has been found in the lowland wheat fields along the Arkansas River. That territory will be visited within a week, and we will try to locate the common barberries that are the cause for this spread of rust, if it is developing from within the State.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). No report.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). No report.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter). No report.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton). (July 17) Twenty-six men are working in six of the southeast-central counties of this State. A large number of barberry bushes already have been found in each of these counties, although the survey is not nearly completed. In a number of instances the evidence against the barberry is very complete. So definite was the rust area close to several bushes in Hanson county that the bushes were located by following through the fields, gradually working toward the more heavily infected area. A resurvey of an old hedge thought to be entirely cleared of seedlings was found to have over 500 seedlings, although the old bushes had been destroyed in 1920 and the place cleared of seedlings in both 1920 and 1921. It is very evident that the seed lay there at least one year, possibly two, before germinating.

(August 2) During the month of July, farm-to-farm survey was done in Bon Homme, Hutchinson, Douglas, Hanson, Davison, Aurora, Sanborn, Jerauld, Spink, and Faulk counties, with an equivalent of six counties completed. A total of 3085 bushes were found on 65 properties during July. Bushes were removed from 20 properties by the field men, but the remainder were ordered removed by the property owners because of the size and number of the bushes.

Two of the field men working near Mount Vernon, Davison county, located a barberry hedge by following through the fields and studying the amount of infection upon the grains. They had no previous knowledge of the presence of a hedge in that community, but noticed that the grain in a certain area south of Mt. Vernon was more severely rusted than in other fields of the county. An examination of that area led to the discovery of 9 bushes which had spread the rust.

Two field men also were sent into Hand county to follow up a report that a certain area near Wessington, South Dakota, always was infected each spring. They found a definite area several miles wide, reaching from Wessington to Wolsey, which apparently always had suffered from the earliest and the worst rust infection in that section. Records already in this office showed that 16 barberries had been found two miles south of Wolsey this spring on the eastern edge of the infected territory at a point closely corresponding to the place where the infection always had seemed to start.

A second annual re-inspection of the famous Sisseton hedge corroborated the data of last year's re-inspection, that the community had very little rust, whereas previous to the removal of the barberries two years ago rust had been much more severe there.

Redfield Forage Experiment Farm, Redfield (Letter of Samuel Garver to Dr. R. A. Oakley, July 30). Our small grains have been unusually good at the station this year, and I am enclosing a few prints that will give you an idea of the growth made. We have threshed a few plats and the approximate yields of two barley varieties were 50 and 55 bushels to the acre. Kanred winter wheat yielded 45 bushels, and rye 50 and 55 bushels. One plat of Odessa barley sown

as a nurse crop for sweet clover, yielded better than 65 bushels to the acre. None of the spring wheat or oat varieties have been threshed, but we expect good yields from them.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel). No report.

J. Allen Clark writes from North Dakota on July 25, 1922, "We are now just east of Jamestown, and the crops are fine, as they have been all across the State (North Dakota) and through Montana. There is plenty of moisture. Rye harvest is about completed, and wheat harvest has started. East of Bismarck one sees very few fields of Marquis. The eastern half of the State has gone largely to durum. This will prevent large rust losses, but I am afraid the price of durum will be very low this fall. West of Mandan there is very little durum. Most of the wheat is Marquis, but there are many fields of Preston (Velvet Chaff). This is unusual for that part of the State. Oats are a big crop and corn is making rapid progress. There is more grass and hay than I have ever seen in the State before. North Dakota has gone in strong for sweet clover (not Hubam).

"I have seen reports of much rust damage in Minnesota, South Dakota, and eastern North Dakota. Will be glad to see for myself the exact situation. There is as much rust now at Mandan and Dickinson as at Fargo two weeks ago. West of the river, though, there will be no damage from rust, as wheat is made in most cases. The rust nurseries at Mandan and Dickinson, however, have more rust now than during the last three years. The notes should not be taken for 10 days yet. For example, Haynes Bluestem has just headed and does not have any rust on it yet, as it has not reached the proper stage for infection. Early varieties, like Red Bobs, have about 60 per cent rust."

On July 27 he writes: "I covered a good part of Cass county and saw a lot of damaged wheat, both Marquis and durum. The latter has rusted badly again this year. Kota had stood the test of the worst epidemic since 1916. The infection seems worse than in the last several years, but the damage may not be as much, as most of the wheat is pretty well ripe. All late wheat will be hurt badly. The rust goes west to about Jamestown in damaging amounts, but there is plenty of infection further west.

"Recently Fargo bankers and others were out to see Prof. Waldron's breeding work and the plats and to see Kota and Marquis fields. Resistant varieties look like a pretty good straw to grab at now."

T. R. Stanton, agronomist in charge of oat investigations, writes from North Dakota on July 31, "In the Red River Valley of North Dakota (especially the southeastern group of counties) and just across the Red River in Minnesota, spring wheat is somewhat infected with stem rust. In the plats at Fargo there was plenty of it, and the maturity of the wheat was being hastened by it. At St. Paul, rust scouts, who recently had returned from inspection trips, reported considerable rust in many sections of the State (Minnesota). Oats also in northeastern Iowa and southeastern Minnesota have been injured by rust. There is probably a worse epidemic in these sections than there has been for some years. A bumper crop of winter rye is being harvested throughout North Dakota."

Agricultural Experiment Station, Agricultural College (Barberry Eradication, George C. Mayoue). (August 3) The barberry eradication work in North Dakota is going very well. I feel that the work will even be more efficient and better than in the past years, because of the fact that the men had special training for their work, and the work is well organized.

I have twenty-four men using twelve cars, in the field. These men are stationed in six adjacent counties so that I can go from crew to crew without unnecessary long-distance travel.

The people of North Dakota are very much interested in our work and are giving us their support. Leading citizens of the counties where we are working have shown their interest through the publicity which they have given our work in many different ways. Bankers and the Railroad administrators are lending much assistance in publicity. The work of the Conference for Rust Prevention of Grain of Minneapolis is very good.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). (July 17) The first half of July was cool and generally favorable for crop growth. Cereals and crops in general look better and are likely to yield better than in any year since 1915.

Maximum temperature for the period from July 1 to 15 was 96° on July 14; minimum, 36° on the night of July 6. One patch of corn growing in a low spot protected from the wind on the station was injured by frost that night. Precipitation for the same period was 1.34 inches.

Messrs. C. W. Warburton and J. Allen Clark visited the Station July 12. In a trip to Hagerott's farm, 20 miles northwest of Mandan, we saw a field of about 60 acres of winter wheat that had been "stubbled in" last fall. The stand was good and the yield of grain was estimated at between 20 and 25 bushels per acre.

The percentage of stem rust in this locality to date is practically negligible, though a trace may be found on susceptible varieties of wheat.

A. C. Dillman left on July 12 for a trip into Minnesota and South Dakota. E. B. Brown arrived today to take notes on corn varieties, and leaves tonight for Dickinson, N. Dak.

(August 2) Weather during the last half of July has continued very favorable for crop growth. Maximum temperature for the period was 94° recorded July 21; minimum, 46° recorded July 16; precipitation, 1.63 inches.

Sixty-Day oats in the varietal plats were harvested July 20, and four midseason oat varieties were harvested July 26. Six of the common wheat varieties were harvested July 27. All of the six barley varieties were har- July 27. Power Fife wheat and all of the durum varieties were harvested August 1. Flax sown on April 15 and May 1 also was harvested August 1.

E. B. Brown visited the station July 17 and left the same day for Akron, Colo., and intermediate points.

A. C. Dillman returned to Mandan July 25 and started on another trip July 30.

Ralph W. Smith, in charge of cereal experiments at the Dickinson, N. Dak., substation, was here July 25.

J. A. Clark was here again July 25 to look over his wheat experiments.

T. R. Stanton, in charge of oat investigations, was here July 27.

H. L. Barker, plant pathologist at the University of Minnesota, visited the station today.

Dickinson Substation, Dickinson (Ralph W. Smith). (July 17) The weather during the first half of July has been favorable to the best growth of cereal crops. Cool weather has prevailed, with frequent showers making a total of about 1.20 inches of rain.

There is a trace of stem rust on susceptible varieties of wheat, but with a continuance of favorable climatic conditions, no serious damage from rust is expected.

Winter rye is practically ripe and well filled. Early varieties of oats and barley and varieties of winter wheat are beginning to ripen. Late varieties in plats and nursery are headed.

Conditions now indicate that grain yields at the Substation will be the best obtained since 1915, if not injured by hail. Some hail is reported a few miles from Dickinson.

The roguing of varietal and increase plats is now in progress.

The Substation was visited July 13 and 14 by C. W. Warburton and J. Allen Clark of the Office, H. L. Westover of the Office of Forage-Crop Investigations, and L. R. Waldron, plant breeder at the North Dakota State Experiment Station.

(July 31) Harvest began on the Substation July 22, with the harvesting of varietal plats of winter rye. Early varieties of barley and oats and also the winter wheat plats were harvested July 28 and 29. Some wheat will be harvested this week. Rye is being harvested in this community.

Weather conditions during the month have been generally favorable, with comparatively cool weather and a rainfall of 1.93 inches.

Crop conditions are unusually good in the Slope region of the State, and wheat, oats, and barley in general will produce the best crop harvested since 1915.

On July 24 the Substation was visited by Assistant Secretary of Agriculture, Dr. C. W. Pugsley; Director P. F. Trowbridge of the State Experiment Station; Director of Extension, G. W. Ramlett; Secretary of Extension, Mr. Andrews; and County Agent Leader, John Haw. During the past two weeks the Substation was visited by J. A. Clark and E. B. Brown of the Cereal Office, and T. R. Stanton and J. H. Martin are at the Substation today. President Coulter of the Agricultural College visited the Substation July 29.

Several hailstorms have been reported from adjoining counties. The last severe hailstorm at the Substation occurred about this time 6 years ago.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). (August 4) I would have replied to your letter earlier if the rush of harvesting had not prevented Since the first of the week we have harvested all of the furrow-drill experimen plats, most of the winter wheat varieties, all of the early oats and barley varieties, and large sections of each the winter and spring nurseries. I expect the yields of winter wheat to go above and the yields of spring grain to fall below average this season.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). No report.

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds). (Aug. 1). The harvest has commenced at the Aberdeen Substation. The fortieth-acre plats of barley are all harvested. Seven varieties are being tried out this year: Trebi, Beldi, Sanarel, Hannchen, Han River, Peruvian, and Smyrna. The straw on all the barleys was short this year, and especially short on the Smyrna. Colsess, a new hybrid from Colorado, also was tried. It is a beardless barley and shows some promise. It developed a small amount of covered smut this year.

The oats varieties are all cut and shocked. The following varieties were tried on the Station this year; Golden Rain, Early Mountain, Idamine, C. I. 724, Registered Swedish Select, Alpion, Richland, Hvitling, Welcome, Wisc. Pedigree No. 3, Victory, American Triumph, Victory from Sweden, Golden Rain from Sweden, Crown from Sweden, and Stephens. They all made a good growth and show promise of an excellent yield. The Victory, Golden Rain, and Crown from Sweden show promise of making a very heavy yield again.

The Rozendaal clover is in the cock and a fair seed crop set. The corn is in the tassel and is shooting ears. The wheat plats will be ready to harvest about the 7th of August, and show indications of making a heavy yield.

The wilt-resistant flax strains have made an excellent growth this year.

The early plats of peas are harvested. The beets and potatoes have made an excellent growth so far this season. The early potatoes are nearly ready for market. The potatoes have all been rogued twice for mosaic and other diseases.

The weather has been extremely hot for the past week, but a rain today has cooled things off to a great extent.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). (August 2) The hottest weather during July occurred in the first week, when the record temperature of 105° was reached on July 3. There was practically no unusually hot weather after the 7th. There was no precipitation during the month. The total rainfall for the crop year from September 1, 1921, to July 31, 1922, inclusive, was 8.71 inches.

Because of the dry growing weather and high temperatures early in July, yields on the Station are considerably lower than usual. Early-sown winter wheat, however, on the Station as well as on farms in this county, has produce fairly satisfactory yields.

The following are the yields obtained on the Station in an experiment which combined rates and dates of sowing Turkey wheat:

Rate in pecks	Acre yield in bushels, from each date					
	Sept. 12	Sept. 26	Oct. 10	Oct. 24	Nov. 6	Average
2	25.3	26.4	24.5	21.9	23.7	24.3
3	27.7	26.1	26.1	24.8	24.5	25.8
4	26.2	27.4	26.7	23.7	25.1	26.3
5	29.3	26.9	27.5	26.4	24.0	26.8
6	29.6	25.3	29.6	25.1	24.5	26.8
7	33.6	26.4	27.7	25.3	25.3	27.7
8	33.6	26.4	30.4	25.9	23.7	26.0
Average	29.7	26.4	27.5	24.7	24.4	

We began thrashing on July 16. The weather has been favorable for thrashing since that date, and if it continues favorable the thrashing will be completed in another week.

Our yields are a little lower than we expected. The tillage plats are yielding from fifteen to twenty bushels per acre. We expect to start thrashing the varieties this week. I shall send you in a few days a preliminary statement of yields for publication in the Courier.

Recent distinguished visitors: C. W. Pugsley, Assistant Secretary of Agriculture, and C. W. Warburton, M. N. Pope, J. A. Clark, and V. H. Florell, all of this Office.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones). (July 31) The weather during July has been favorable for the growth of rice. The station crop is making a fairly good growth; however, it lacks vigor and the dark green color which usually are associated with high yields, but on land that has been cropped as frequently and as long as the station has, we can not expect to obtain high yields.

Most of the rice has begun to joint, and a few of the earliest varieties, in the nursery, are heading.

The commercial crop is looking fairly good. Of course, there are many fields which are very foul, and at this time one can hardly see any rice plants on such fields, due to the heavy growth of water grasses and cattails.

The maximum temperature for July was 108° on July 4; minimum, 52° on July 29; and the greatest daily range was 41 on July 30. There were ten days during July when the maximum temperature was 100° or above, and an additional 7 days when the maximum was 96° or above. The total evaporation for July was 8.93 inches.

University Farm, Davis (V. H. Florell). (August 2) The threshing of cereals in field plats and nursery was completed on July 19. Yield data will be reported on as soon as average yields are computed. Varieties of grains in plats are now being recleaned. Studies and threshing of wheat hybrid material will be begun in a few days.

The harvest of the grain fields in the Sacramento Valley is nearly completed. In returning from the Agronomists' Conference at Pullman and Moscow last week, only a few fields of wheat toward the northern end of the Valley were yet observed to be standing.

Sacramento Valley grain crops are in general very good. The fall-sown grain is best as usual, but winter and spring sowings are also good. A field of hard Federation wheat near Davis sown on March 1 produced at the rate of 10 bushels per acre. A field of the same variety at Chico, sown on March 6, produced at the rate of 12 sacks per acre.

Agricultural Experiment Station, Berkeley (W. W. Mackie). No report.

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Library

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

Vol. 14 August 21, 1922 No. 1,
Personnel (August 11-20) and Field Station (August 1-15) issue.

PERSONNEL ITEMS

Norris J. Anderson, field assistant in barberry eradication in South Dakota resigned effective July 31, 1922.

Lewis L. Crosby, field assistant in barberry eradication with headquarters at St. Paul, Minn., resigned August 10, to accept a permanent position.

Samuel S. Feldman has been appointed field assistant in barberry eradication in Wisconsin, effective August 25, 1922.

Dr. H. B. Humphrey, pathologist in charge of Cereal Diseases Investigations will leave Washington on August 21 to inspect the investigations of cereal diseases cooperative with the State Agricultural Experiment Station and other agencies in Wisconsin, Minnesota, N. Dak., S. Dak., Kansas, Iowa, Illinois and in Indiana. He will be gone about a month.

Dr. F. E. Kempton, pathologist in charge of Barberry Eradication, left Washington on August 14, to inspect the progress of barberry eradication in the North-central States.

Joseph G. Kempton has been appointed field assistant in barberry eradication in Indiana, effective August 10, 1922.

Forrest D. McCrea, field assistant in barberry eradication with headquarters at LaFayette, Ind., completed the work for which he was appointed and tendered his resignation effective September 9, 1922.

Malcom B. Melroy who has been under temporary appointment as field assistant at Arlington Farm, has completed the work for which he was assigned and tendered his resignation effective August 31; 1922.

Merritt N. Pope, agronomist in Barley Investigations returned to Washington on Aug. 11, after an absence of three months. During most of this period he has been engaged in studying the barley nurseries grown in California and Idaho.

Frederick D. Richey, agronomist in Charge of Corn Breeding and Cultural Investigations, left Washington, D. C., on August 16 for LaFayette, Ind., Urbana and Bloomington, Ill.; Ames, Iowa; Lincoln, Nebr.; Manhattan, Kans., and Columbia, Mo. to visit cooperative corn experiments and confer with station officials and others regarding future experimental work with corn.

Dr. Wilfred W. Robbins, former botanist in barberry eradication, with headquarters at Madison, Wis., has been appointed Collaborator in the Office. Dr. Robbins resigned on July 24 to accept a position with the University of California.

Ralph H. Rogers, who has been under temporary appointment as field assistant in barberry eradication with headquarters at LaFayette, Ind., has completed the work for which he was assigned and tendered his resignation effective August 31, 1922.

T. Ray Stanton, agronomist in charge of Oat Investigations, who has spent the last several weeks studying oat nurseries in Iowa, and Idaho, and inspecting oat experiments at other stations, left Aberdeen, Idaho, on August 19 and will arrive in Washington on August 31 after taking annual leave at Cumberland, Md.,while en route.

From Aberdeen he reports that "Crop conditions here in southern Idaho are excellent. Wheat is now about ready for harvesting and oats is being harvested. A bumper crop of potatoes is in prospect. With the unusual large acreage and a big acre-yield the supply will be greatly in excess of the demand. The best acreage is just about one half that of last year, but the crop is in good condition and an excellent tonnage will be obtained.

Several excellent fields of Idamine oats in the vicinity of Aberdeen were visited by the writer in company with the assistant State seed inspector. Apparently considerable certified seed of this variety will be available for sowing next spring in southern Idaho.

The oats in the nursery are ripening rather slowly, but the bulk of them will be ready for harvest within the next few days."

C. W. Warburton, who has been visiting and inspecting cereal experiments conducted by this Office at California, and arranging the details of cooperation with the State Agricultural Experiment Station has been able to make train connections eastward and arrived in Ogden, Utah, on August 13 en route to Aberdeen, Idaho. From there he goes to Akron, Colo., Hays, Kans.(Aug.21), Manhattan, Kans. (Aug. 22-23) , Woodward, Okla. (Aug. 25), and Ames, Iowa (Aug. 26-29) He expects to arrive in Washington on Sept. 2.

MANUSCRIPTS AND PUBLICATIONS.

Department Circular No. 229, entitled "Wild Rice", by Charles E. Chambliss, was issued on August 15. The manuscript was transmitted on March 7.

Engraver's proofs of the illustrated covers for Farmers' Bulletins 1280 and 1281, "The Hard Red Winter Wheats" and "The Hard Red Spring Wheats", respectively, were approved on August 12.

Page proof of Yearbook Separate No. 872, entitled "The Corn Crop" by Dr. C. E. Leighty, et al. was read on August 17.

Page proof of Yearbook Separate No. 875, entitled "Wheat Production and Marketing," by Dr. C. R. Ball, et al. was read on August 17.

Engraver's proofs of the illustrations for Department Bulletin No. 1116, entitled "Seedling Blight and 'stack burn' of Rice and the Hot Water Seed Treatment" by Dr. W. H. Tisdale were received and approved on August 17.

Engraver's proofs of the two half tone illustrations for Department Circular 208, entitled "Trebi Barley" by Dr. H. V. Harlan and Mr. Merritt N. Pope, were approved on August 19.

The second page proof of pages 1 to 119, inclusive, of Department Bulletin No. 1074, entitled "Classification of American Wheat Varieties," by Clark, Martin and Ball, was read on August 19.

Purdue University Extension Bulletin No. 108, entitled "Selecting Seed Corn in the Field," a cooperative publication by Dr. G. N. Hoffer and Prof. A. T. Wiancko, was received here on August 19.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report).

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly) No report.

VIRGINIA

Arlington Farm, Rosslyn (J. M. Taylor) (Aug. 9) The last of the rod row threshing was completed this week and the weighing of the individual row yields is practically through. The heavy lodging which occurred in the wheat nursery made threshing difficult and caused a poor quality of grain as the kernels were shriveled.

The yield of the wheat plats as a whole is higher than the 12 year average. Purple Straw C. I. 1957 was high yielder with a 3 plat average of 37.4 bushels. It outyielded its check plats, Purple Straw C. I. 1915 in all three series. Rod Row 959 a head selection made by Dr. C. E. Leighty also outyielded its checks in all three cases. This is an awnless, red chaff wheat which has been grown in plats for 2 years. The yield for 1921 was not promising as it lodged badly at flowering time. Illinois Fults and Pennsylvania #++, two varieties grown in plats at Arlington for the first time show promise of being adapted to Arlington conditions.

Arlington Farm, Va. - - 1922 - Wheat yields.

Variety	C.I.No.	Bu.per A.	Variety	C.I.No.	Bu per A.
Purple Straw	1957	37.4	Rocky Mt.	1930	30.2
Rod Row 959	-	36.6	Brown Winter Fife	1933	29.0
Mammoth Red	2008	36.0	Rod Row 676	-	28.9
Hybrid	3614	34.3	Dietz	1981	28.4
Lancaster-Fulcaster	1945	32.8	Hybrid	3600	28.3
Poole	1973	32.7	Poole	3465	28.2
Missouri Bluestem	1912	32.7	New Amber Longberry	1973	27.8
C. I.	6163	32.6	Stoner	2960	27.6
Rod Row 62		32.4	Currell	3320	26.1
Rod Row 294		32.0	Fultz	3590	26.0
Fulcaster	6162	31.7	China	100	25.5
Illini Chief	3400	31.6	Bearded Purple Straw	1911 -1	25.1
Fultz	1983	31.3	Bearded Purple Straw	1911	24.8
Purple Straw	1915	31.2	Haynes	2674	24.3
	(Average 36 plats)		Power Fife	3697	19.7
Leap	4023	31.2	Nebraska Hybrid	3147	19.1
Red Rock	5976	31.1			
Early Genesee Giant	1744	30.6			
Poole Type	1755	30.5			
Dawsons (Cornell Sel.)	6161	30.4			

Above yields taken from average of 3 -1/40 acre plats.

Illinois Fultz	-	(Average 2-1/40 acre plats)	31.9
Pennsylvania 44	-	(Average 1-1/40 acre plats)	31.3
Forward	-	(Average 1-1/30 acre plats)	26.7
Red Row 115	-	(Average 1-1/40 acre plats)	25.7
Kanred	5146	(Average 1-1/40 acre plats)	25.7

Dr. Leighty reports that Stinking smut or bunt was found in some plats of Purple Straw wheat C. I. No. 1915 grown this year at Arlington Farm in experiments with fertilizers conducted by the Bureau of Chemistry. The seed for sowing these plats was obtained from the Office of Cereal Investigations and was from the same lot used in sowing our own wheat plats. Stinking smut occurred in the former plats but not in our own. The only explanation so far suggested of this occurrence of smut is that it came about through the sowing of this wheat on land used for an experiment on stinking smut last year. In this experiment, counts on infection were made, after which smutted plants were allowed to remain on the ground, later being plowed under in preparation for wheat sowing. It appears that the wheat sown on this land was infected in this way by smut spores present in the soil. The rainfall during the period from harvest to seeding time last year was unusually low and it is probable that the smut spores remained in the unthrashed heads of wheat left on the land in a viable condition until seeding time. Infection of wheat by stinking smut spores present in the soil apparently does not occur very often in the Eastern States. Its occurrence in this instance, therefore, will be of interest.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love)

No report.

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Dr. Harry V. Harlan, agronomist in charge of barley investigations in the Bureau of Plant Industry, returned on August 6 from a study of barley varieties in New York, Ontario, and Prince Edward Island, with especial reference to the identification of the varieties grown commercially and experimentally in this northeastern portion of the barley-growing area of North America.

In New York State a number of fields of Featherston and Alpha barleys were inspected. These are varieties produced by the U. S. Department of Agriculture which were found by the Department of Plant Breeding at the Cornell Station to be valuable for New York conditions and have been distributed by that Department. The Featherston is a 6-rowed selection of the Manchuria group. Alpha is a selection of the Hanna type from a cross of Manchuria on Champion of Vermont. The name Alpha was given by the Cornell plant breeders.

At the Central Experiment Farm, Ottawa, Canada, a number of the hybrids barleys produced by Dr. C. E. Saunders were identified. It also was found that the variety grown widely on Canadian stations as Swedish Chevalier was secured from the United States Department of Agriculture and is the variety grown in this country as Chevalier II. It originally came from Svalof, Sweden.

On Prince Edward Island the Chevalier variety is the barley commonly grown. In most of the barley-growing States of this country this variety lodges badly because of its tall growth and weak straw. On Prince Edward Island this excessive growth of straw does not take place. There are a few districts in the United States that are adapted to the growing of this variety.

HUMID MISSISSIPPI VALLEY STATES (South to North).

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report).

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (Aug.17) Yesterday I completed the taking of the individual plant notes on the 2,000 hand pollinations. The remainder of the week will be devoted to securing material from the several families and crosses that will show the various chlorotic conditions present in these strains. I hope to use this material for some cytological studies through the winter.

I am planning to leave here the first of next week to look over the work in Indiana and Illinois.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) Mr. Merle T. Jenkins, in charge of the cooperative corn project at Ames, Iowa reports under date of August 5th that they are nearly through hand-pollinating. Something over 6,500 plants have been self-fertilized in connection with this project. Weather conditions have been favorable on the whole, and everything promises a successful first year's work.

Iowa State College, Ames (Barberry Eradication, J. H. Muncie)(No report).

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office, Urbana (Barberry Eradication, G. C. Curran) (No report).

INDIANA

Purdue University, Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report).

Botany Department, Purdue University, Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson).

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report).

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report).

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Noel F. Thompson) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E.C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report).

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (No report).

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report).

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (Aug. 1-15) Weather conditions have been very favorable to growing crops on the Akron Field Station, during the past half-month. We have been extremely fortunate, however, as many sections in this part of the state have been visited by very disasterous hail storms. In some sections practically all crops were ruined or at least seriously damaged. Most of the hail storms have occurred since the winter wheat has been harvested. In some sections such severe storms were experienced that corn and row crops were cut to the ground, small pigs and poultry were killed outright or drowned and buildings were seriously damaged.

A St. Louis and Denver train on the Burlington line was caught in a very severe storm and was compelled to stop until the storm passed over. During the storm all of the windows and ventilators on the north side of the coaches, and many of those on the south side were broken out. The hail stones were said to be simply pieces of rough ice many of them the size of hen eggs. The stones were so large and driven by such a strong wind that they went through both sashes and the screens in the Pullman car windows. Where the curtains were pulled down as a last resort they were ripped to shreds. The passengers took refuge under the seats on the north sides of the cars. After the storm the hail was said to be several inches deep over the floors of the cars and when the train was finally able to pull into Akron, a distance of some 4 miles, many of the passengers were given medical treatment for cuts made by flying glass and bruises from the hail stones. The train was quarantined at Akron, and a new train made up to carry the passengers on east to their destinations.

During the half month the grain has been too damp most of the time for threshing. While threshing operations were started early in the month they have been suspended several times on account of rain. At the present time possibly one-third of the 1922 small grain crop at Akron has been threshed. All of the oat plats of the Office have been threshed. Many of the plats yielded between 30 and 40 bushels to the acre. An increase plat of slightly more than one acre gave a yield of better than 42 bushels to the acre. With conditions favorable, it is likely that most of the threshing on Akron Field Station will be completed before September 1. The nursery thresher has been put in condition for the seasons run and the nursery threshing should not prove as great a task this season as in some former years.

While the past two weeks have been rather unfavorable for threshing operations they have been very favorable for growing crops. Some of our sorghum selections give some promise of proving of value in this section. Our aim has been to produce a grain sorghum, early enough in maturing to escape frosts under Akron conditions. One selection from Dawn Kafir which was selected in 1921, from a row grown from an early maturing head selected from the varietal plat of Dawn in 1920, gives considerable promise.

Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons). (No report).

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). (No report).

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report).

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter), During the past month barberries have been removed from two properties in Cheyenne, one being the State Capitol grounds, and the other the Governor's Mansion. On the resurvey trip made to the western part of the State, bushes were removed from one property in Uinta County and one in Lincoln County. The State is now clear of all known barberries with the exception of Laramie County. The Cheyenne hedge has not been removed as yet but plans are under way for its removal this winter. Eight properties, all in the city of Cheyenne, still have barberries. As no stem rust was found in Carbon, Sweetwater, Uinta, Lincoln, or Fremont Counties, rust has not been found in this State this year.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (No report).

Redfield Forage Experiment Farm, Redfield (Samuel Garver) (Aug. 14) In accordance with a letter just received from Dr. Oakley. I am enclosing a record of the seed yields obtained from oat, barley, wheat and rye varieties at the Redfield Field Station this season.

I am not attempting to give a detailed report at this time but will say, however, that we had a quite uniform set of plats this year, as regards stands and growth and a good quality of seed was obtained in all cases. Rust did not develop sufficiently to materially effect seed quality and yields. The yields of the later maturing varieties, especially of oats were reduced by drought however.

I trust the data given in the enclosed tables will give the information of greatest interest at the present time, and will plan on furnishing you a more detailed report this winter.

Stands were good in all cases except local rye, plat 7, which was rather thin. All plats were one-twenty fifth acre in size, except Star rye which was one-fiftieth acre. Bushels of oats were calculated at 32 pounds, and of barley at 48 pounds.

Series 11-30: Plat	Crop	C.I. Number	Weight Per Bu. "In Part"	Seed Yield Actual: Pounds	Per Acre Pounds	Per Acre Bushels	Average of Variety Bus
1	Marquis Wheat	3041	60.0	80½	2012	33.5	
9	Marquis Wheat	3041		71½	1787	29.8	31.6
2	Preston Wheat	3081	60.5	81½	2037	33.9	
10	Preston Wheat	3081		72½	1812	30.2	32.0
3	Kubanka Wheat	1440	61.3	81½	2037	33.9	
11	Kubanka Wheat	1440		79	1975	32.9	33.4
4	Acme Wheat	5284	62.2	89½	2237	37.3	
12	Acme Wheat	5284		82½	2062	34.4	35.8
5	Kota Wheat	6248	59.6	55½	1387	23.1	
13	Kota Wheat	6248		47½	1187	19.8	21.4
6	Pierson Wheat	-	62.1	72½	1812	30.2	
14	Pierson Wheat	-		68	1700	28.3	29.2
8	Kanred Winter Wheat	-	60.7	112	2800	46.6	
16	Kanred Winter Wheat	-		104	2600	43.3	44.9
7	Local Rye	-	57.5	36	2190	36.4	
15	Local Rye	-		140	3500	58.3	50.4
	Star Rye	-	57.2	60½	3025	54.0	54.0

In calculating the number of bushels, 60 pounds of wheat and 56 pounds of rye were figured for a bushel.

Series 411-30 Plat	Crop	C. I. Number	Weight Per Bushel "In Dirt"	Actual Per Acre Pounds	Actual Per Acre Bushels	Average of Variety Bushels
1	Iowar Oats	1647	33.8	93	2325	72.6
8	Iowar Oats	1647		105	2625	82.0	77.3
2	Richland Oats	1787	36.0	115	2875	89.8
9	Richland Oats	1787		106	2650	82.8	86.3
3	Silver Mine Oats	1659	32.8	96	2400	75.0
10	Silver Mine Oats	1659		104½	2612	81.6	78.3
4	Swedish Select Oats	1154	33.5	86	2150	67.2
11	Swedish Select Oats	1154		102½	2567	84.0	75.6
5	Odessa Barley	1182	46.2	89½	2237½	46.8
12	Odessa Barley	1182		106	2650	55.2	50.9
6	Hannchen Barley	1531	46.1	93	2325	48.4
13	Hannchen Barley	1531		106½	2712	56.5	52.4
7	Manchurian Barley	1354	45.6	104	2600	54.2
14	Manchurian Barley	1354		110	2750	57.3	55.7

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (Aug. 15) Dr. R. B. Harvey of the Minnesota Station was here July 31 and August 1 in connection with some special temperature determinations of flax plants, soil, and air, bearing on the subject of heat canker. According to Dr. Harvey's instructions we installed special apparatus for taking temperatures by the thermocouple method. By this method it will be possible to obtain temperature readings under many conditions to which the mercury thermometer is not adapted.

Mr. J. A. Clark of the Office was here August 3 looking after cooperative work at this station.

Dr. M. N. Levine of the Minnesota Station and Cereal Office was here August 4 studying the wheat rust nurseries which were sown at Fargo, Eugeley, and Langdon, N. D. last spring.

Harvesting of flax in the various experimental plats is now under way. Intense heat and dry weather has materially advanced the maturity of all varieties to a date earlier than expected.

The writer visited several commercial fields of flax in Minnesota near the towns of Georgetown, Perley, Henarum, Halsted, Ada, Bejoe, Hinger, and Fosston on August 4 and 5. Several specimens of diseased flax were collected wilt being the most common. Most fields had wilt ranging in amount from a trace to severe infection. No canker occured in the fields examined while a trace of rust appeared in most fields and a small area of Rhizoctonia infection was found in one field.

Agricultural Experiment Station, Agricultural College (Barberry Eradication, George C. Mayou). Beginning with July 1, twenty-four men were put in the field to make a farm to farm survey, besides surveying the towns in the same area, for barberry. These men were placed in Bottineau, Towner, Rolette, Pierce, Wells and McHenry counties, an area in the northern part of the state adjacent to Canada, and the territory which was completed in the state previous to this year.

Four hundred and fifty bushes were located on nineteen properties in the rural districts. One of these properties of seventy bushes was located in Renville county by the men working in Bottineau county. One property each in Ricky and Hettinger counties was located by the county agents of these counties. One property in Ramsey county was located by a banker in that county.

Resurvey work was carried on in Stutsman county. Fifty-six sprouts were located on eleven properties.

Demonstrations were made at the State Fair, Fargo, the Interstate Fair, Grand Forks, and at county fairs at Fessenden, Wells county; Wahpeton, Richland county; Devils Lake, Ramsey county, and Bowbells, Burke county. These demonstrations proved very successful. Several leads to barberry were secured at these fairs. The people showed a great deal of interest in the demonstrations, asking more questions and paying more attention to our exhibit than ever before. Demonstrations were also made in banks and especially in drug stores in the area where the men are working. A demonstration and talk was made at the Bankers' Meeting of Bottineau county which was held at Willow City.

Mountings have been placed in many of the banks and depots by our office, besides the mountings which were placed in these places by the Rust Prevention Association of Minneapolis.

Due to the fact that the roads in the area where the work in conducted are very poor in most places, the work is not progressing as fast as was expected. Also the field men are spending a little more time talking to the people this year concerning the work, which is another reason for not covering the territory faster than we are doing.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.)(Aug.17) The first half of August has been the hottest, driest period of the season. Maximum temperature for the period was 101° on Aug. 13; minimum 51° on Aug. 7; precipitation .23 in.

The harvesting of White Russian oats on Aug. 8 completed the harvest of cereal varieties in plats.

The June 1 seedings of the date-of-seeding and tillage experiment will be harvested to-day leaving only the June 15 seedings of the flax plats to be harvested later.

Thrashing of the cereal varietal plats will begin to-morrow.

Flax nurseries are ripening rapidly and will be ready to harvest by the first of next week.

Dickinson Substation, Dickinson (Ralph W. Smith) (Aug. 15) All cereal plats have been harvested except flax varieties, and the harvesting of the nursery was finished today. The thrashing of cereal crops is expected to begin tomorrow. Hot, dry weather this month has hastened the maturity of cereal grains.

The precipitation for the first half of August was in the form of light showers totaling about half an inch. Some of these were accompanied by still warm weather that favored the development of stem rust which was already present on the wheat varieties. It is not expected that the yields at the Substation will be seriously affected but some late sown fields of Marquis in this vicinity will be reduced in yield and quality by the rust.

Some winter rye has been thrashed in this county and yields of from 15 to 25 bushels per acre have been reported. Farmers are in the midst of the wheat harvest and by the last of the week most of it will have been harvested.

Mr. M. W. Lavine visited the Substation on August 12 and took rust notes on the rust nursery. More rust was present than in any previous year since this nursery was sown here. Mr. Martin finished harvesting and thrashing about 5,000 selections in his winter hardiness nursery and left for Moccasin, Montana, on July 13.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Aug. 14) The precipitation for July was 1.11 inches and for the first half of August .12 inch. The precipitation for July was .85 of an ich below average.

We are having a prolonged drouth which has injured the yields of all crops but particularly late-sown spring crops. However, the yields of spring grain on the Experiment Farm will probably be about average.

Almost all of the winter wheat, oats, and barley under the Cereal Project have been harvested while only the earlier varieties of spring wheat and flax are ready for harvest. We expect to begin harvesting some of the spring wheat nursery rows this afternoon.

Grasshoppers have been and still are quite a menace. The grasshoppers have not yet done any great damage although they have perhaps damaged the oats from 1 to 4 per cent. The grasshoppers prefer the oats to any of the other spring grains. We have spread the grasshopper poison a half dozen times or more in places and we have killed an enormous number of the grasshoppers but they continue to migrate in. There is a possibility that we may not be able to save the corn from the grasshoppers because they will migrate to the corn after other vegetation has dried up.

Threshing winter wheat on the Experiment Farm will begin within ten days or two weeks. Some neighboring farmers have begun 'combing' winter wheat and have sold the new wheat on the market although the wheat is surely too soft to store.

Mr. A. C. Dillman of the Office is here today and Mr. J. H. Martin is expected this afternoon. Mr. Osenbrug, Superintendent of the Station, has been visiting at Mandan, N. Dak. several days but is expected here tomorrow.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). (No report).

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report).

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). (Aug. 12) All threshing except the nursery is completed on the Station. One day's work was done on the nursery when a shower on the night of August 11th of nearly a half inch stopped operations. The weather is still threatening. About two days' work will be necessary to finish the nursery. The harvesting of wheat in the county is just a little more than half completed.

Yields of winter and spring wheat varieties are given in the following tables. Higher yields were obtained from the spring wheats this season. This is unusual as winter wheat usually outyields spring wheat from 20 to 30 per cent. The only high yields of winter wheat obtained in the county were from early fall sowing.

YIELD OF WINTER WHEAT VARIETIES
MORO, OREGON, 1922.

Variety	C.I. No.	Yield Bushels per Acre. Series 1	Series 2	Series 3	Average
Hybrid	4512	21.3	22.7	19.7	21.2
Triplet	5406	22.0	21.0	19.3	20.8
Turkey x Hybrid 128	Sel. 52		19.7		19.7
Turkey (local)	4429	19.3	19.3	16.7	18.4
Blackhull	6251	19.3	19.0	17.3	18.4
Fortyfold	4156	22.0	18.0	14.3	18.1
Hybrid 123	4511	19.0	19.0	16.3	18.1
Turkey	1571	17.0	19.3	17.0	17.8
Alberta Red	2979	16.3	20.7	16.3	17.8
Sevier		15.7	19.3		17.5
Turkey	1558	17.0	20.3	14.7	17.3
Kharkov	1442-12	18.0	18.0	15.3	17.1
Alaska x Jones Fife	6682	17.7	17.7	15.7	17.0
Kanred	5146	17.0	18.0	15.7	16.9
Argentine	1569	18.0	17.0	15.3	16.8
Nebraska 60	6250	17.3	16.7	15.7	16.6
Fortyfold x Little Club	6681	18.0	18.0	12.7	16.2
Alberta Red	5971	15.0	17.0		16.0
Minturki		13.0		14.7	13.9
Karmont	1563	14.7		12.7	13.7
Turkey x Hybrid 128	Sel. 50			12.7	12.7

YIELD OF SPRING WHEAT VARIETIES
MORO, OREGON, 1922.

Variety	C. I. No.	Yield Bushels per acre. Series 1	Series 2	Average.
White Federation	4981	26.3	22.0	24.2
Sunset	4728	24.0		24.0
Currawa	4982	23.3	23.0	23.1
Federation	4734	22.3	20.3	21.3
Bobs	2826-1	21.0	21.3	21.2
Hard Federation	4735	18.6	23.3	21.0
Bungulla	4166	18.7	23.0	20.8
Early Baart	1697-172	21.0	20.3	20.7
Pacific Bluestem	4067	20.0	21.0	20.5
Boadicea	6220	19.0	21.0	20.0
Red Bobs	6255	20.3	19.3	19.8
Early Baart	1697	18.0	21.0	19.5
Firoark	4169	17.3	19.7	18.5
Canberra	4980	17.0	18.7	17.8
Little Club	4066	19.3	15.7	17.5
Major	4984	18.7	16.3	17.5
Marquis	4156	15.3	18.7	17.0
Onas	6221	16.7		16.7
Ruby	6047	14.0		14.0
Kota	6248	10.3		10.3

Yields of the smut-resistant wheat varieties sown in single twentieth-acre plats were as follows:

YIELDS OF SMUT-RESISTANT WHEAT VARIETIES
MORO, OREGON, 1922.

Variety	Yield Bushels Per acre.	Bushel Weight.	Number Smutted Heads per 1/20 acre.
White Odessa (4655)	23.3	55	0
Sherman (4430)	20.7	55	0
Turkey x Florence (G334)	19.3	51	0
Turkey (1551-B)	19.3	55	0
Crimean (3055)	18.7	55	0
Turkey (1571C)	17.7	55	0
Turkey (1551A)	17.7	55	23
Hussar	17.4	55	0
Crimean (2576A)	17.4	53	1
Turkey (1571) Check	19.2*	55	

* Average of four one-twentieth acre plats. All other varieties single one-twentieth acre plats.

The following are the yields of spring barley varieties at Moro. These varieties were all grown on duplicate twentieth-acre plats on ground summer fallowed in 1921. There was no rainfall between the dates of planting and maturity that was of any benefit to the growing crop.

YIELD OF SPRING BARLEY VARIETIES
AT MORO, OREGON, 1922.

Variety	C.I.No.	Series 1	Series 2	Average
		(Bushels per acre)		
Mariout	261	29.6	45.0	37.3
Flynn	1311	28.8	35.0	31.9
Moloy	1176	25.4	32.5	28.9
Peruvian	935	24.7	31.7	28.2
Belai	190	26.7	27.9	27.3
Himalya	620-1	24.2	26.7	25.5
Trebi	936	19.2	29.6	24.4
Coast	626	25.8	22.5	24.1
Peru	702-1	22.5	25.0	23.8
Odessa	927	20.4	23.8	22.1
Hannchen	531	17.1	22.5	19.8
Hanna	906	14.6	23.8	19.2
Smyrna	658	20.8	16.3	18.6
Arequipa	1256	30.0	.....	.....

The following results were obtained in an experiment on the harrowing of winter wheat in the spring:

SPRING HARROWING OF WINTER WHEAT, 1922

		Not Harrowed	Harrowed
		(Bushels per acre).	
April 1	Plowing	17.5	19.3
May 1	Plowing	20.0	19.0
June 1	Plowing	13.7	15.2
Fall	Plowing (Dry)	16.8	16.7
Fall	Plowing "	17.2	17.3
Fall	Plowing (Wet)	16.7	16.8
Fall	Plowing "	13.3	14.2
	Average	16.5	16.9

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C E R E A L C O U R I E R

Official messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 August 31, 1928. No. 1.

Personnel (August 21-31) and Project Issue.

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PERSONNEL ITEMS

Dr. E. A. Emerson, head of the department of [illegible] at Cornell University has been appointed collaborator of this Office, in order to make his services available as a consulting specialist in the genetics of corn. He has been authorized to come to Washington on or about Sept. 10 to confer with Mr. Richey and Mr. Kyle on the work in progress and on plans for next year.

Harold J. Enright, field assistant in barberry eradication with headquarters at Brookings, S. Dak., completed the work for which he was appointed and resigned, effective August 21.

Herbert R. Gilmore has been appointed field assistant in barberry eradication effective Aug. 14, with headquarters at LaGrange, Ind.

C. R. Hursh, assistant pathologist and agent in rust investigations at the Minnesota Station spent four days in the Washington office August 2 to 6 in conference with Dr. Ward and others in connection with investigations of various phases of plant physiology. En route here he stopped at Madison, Wis., Urbana, Ill., and La Fayette, Ind. to confer with Dr. Dickson Nottes and Hoffer respectively on the various physiologic aspects of their investigations.

Charles J. Huxel, field assistant in barberry eradication, with headquarters at Urbana, Ill., completed the work for which he was appointed and resigned, effective August 15.

Dr. Aaron G. Johnson, pathologist in charge of the investigation of fungi in the Bureau of Plant Industry, will leave Washington about September 7, to inspect cooperative investigations of these diseases, including corn, root, stalk and ear-rots, wheat scab, seedling blight, take-all and foot rot, blotch and stripe diseases of Barley, and [illegible] Investigations are conducted cooperatively with various experiment stations or other agencies in the north-central States. Dr. Johnson will visit the stations in Indiana, Illinois, Wisconsin, Minnesota, North Dakota, South Dakota and Iowa.

Henry N. Kaldahl, has been appointed field assistant in barberry eradication with headquarters at St. Paul, Minn., effective August 16, 1922.

R. S. Kirby, Instructor in Plant Pathology, Cornell University, who has been assisting in epidemiology studies of black stem rust and recently has been engaged in preparing a joint manuscript, at the Minnesota station spent August 30 in Washington en route to Ithaca, N. Y. Before coming to Washington, Mr. Kirby visited Missouri, Mississippi, and Tennessee for the purpose of collecting certain strains of stem rust which previously had been found in those States. These special strains are desired by Mr. Levine at St. Paul.

Curtis H. Kyle and Hugo S. Stoneberg, of the Bureau of Plant Industry, left Washington on August 27, to visit cooperative investigations of the root, stalk, and ear-rots of corn, and the breeding of rot-resistant varieties, at Purdue University Agricultural Experiment Station, La Fayette, Indiana. They will return to Washington about September 2.

T. R. Stanton, Agronomist in Charge of Oat Investigations, returned to Washington on August 29 after an extended field trip of about two month in the interests of oat investigations. Stops were made in Missouri, Kansas, Colorado, Iowa, Minnesota, North Dakota, Montana, and Idaho. More than half this period was spent in studying and recording data on the oat breeding and identification nurseries maintained at Ames, Iowa, Dickinson, North Dakota, and Aberdeen, Idaho. Mr. Stanton reports that, in general, the oat crop on most of the stations was in excellent condition and that valuable data will be obtained.

Dr. William H. Weston, Jr., professor of Cryptogamic Botany at Harvard University and formerly in charge of the downy mildews investigations has been reappointed effective August 23 to complete preparation of manuscripts embodying the results of his research.

VISITORS

Carlyle Carr, formerly field assistant with this Office in connection with the corn, root, and stalk investigations conducted at Bloomington, Ill., called at the Washington Office on August 28.

R. J. Noble, pathologist of the Department of Agriculture of New South Wales, Australia, was an Office visitor August 25 and 26. Mr. Noble, who is spending two years in graduate study at the University of Minnesota, is attending the summer conference of American Plant Pathologists being held in and around Philadelphia.

Dr. I. B. Pole-Evans, pathologist of the Union of South Africa is making a flying trip to United States to study Citrus-canker eradication and cold storage of agricultural products, was in conference with members of the office staff on August 29.

Prof. Karl S. Quisenberry, formerly employed on the wheat breeding experiments of this Office at the Kansas Agricultural Experiment Station, and now in the Farm Crops Department of the West Virginia College and Station, was an Office visitor on August 30.

MANUSCRIPTS AND PUBLICATIONS.

A paper by Charles S. Reddy and James Godkin entitled: "A Bacterial Disease of Brome-Grass" was approved on August 22 for publication in Phytopathology.

The second page proof of pages 120 to 256 inclusive, of Department Bulletin 1074 entitled: "The Classification of American Wheat Varieties" by Clark, Martin, and Ball was read and returned on August 24.

Galley proof of Dept. Circ. 208, entitled "Trabi Barley: A Superior Variety for Irrigated Land", by Harlan, Pope, and Aicher, was read on August 25.

Galley proof of Department Bulletin 1120 entitled: "Investigations of Heat Canker of Flax", by Charles S. Reddy and William E. Bentzel was read on August 26.

A manuscript entitled: "Experiments in Wheat Production on the Dry Lands of the Western United States", by David E. Stephens, Max A. McCall and Aaron F. Bracken was transmitted on August 31, for publication as a professional paper in the Department Bulletin series.

BAOL OF AEROPOKTS

Ele-B. RUST INVESTIGATIONS.
(Dr. H. B. Humphrey, Pathologist in Charge).

COLLECTING SPORES IN THE UPPER ATMOSPHERE BY MEANS OF AEROPLANES.

The aeroplane spore trap observations were undertaken in general to determine the spore content of the air at various levels, with particular empahsis on the possibility of this spore content influencing the development of epidemics of black stem rust in the upper Mississippi Valley. The collection of spores at various altitudes in different localities throughout the Valley should give valuable data as to the amount of inoculum that might be carried under these varying conditions. It should also furnish some valuable information relative to the south-to-north spread of rust. In addition to the spore content of the upper air, viability studies are being made to determine whether or not these spores, carried at the higher altitudes, are capable of functioning in producing an epidemic. In other words, are these spores generally capable of germination?

In accordance with these plans, cooperation between the War Department and the Department of Agriculture was effected and stations were established for aeroplane observations at Fort Riley, Kansas, Fort Sill, Oklahoma, Kelly Field, Texas, Chanute Field, Illinois, McCook Field, Ohio, and Camp Knox, Kentucky. Possibly the most complete series of observations have been made by Mr. Ostrom at the various fields in the Southwestern States. He has exposed slides at various altitudes at five-day intervals throughout the spring and early summer. This, it is hoped, will give a rather complete history of the development of rust in these States and the movement of spores in the atmosphere. The numerous spore catches should furnish some information as to the possible spread of the rust from south to north when correlated with the chronological developments that have been recorded during the season in these States. A sufficient number of these slides have been examined to show that a large number of spores have been caught in these flights; it will take, however, considerable time to complete the counts and summarize and analyze the data. Germination tests will not be made for the spores caught in this section except for the more recent of these flights.

The U. S. Department of Agriculture in cooperation with the Minnesota National Guard have established a flying station at St. Paul for making studies in the spring-wheat region. Two fully equipped aeroplanes with pilots and observers were ordered out by Governor Preus to work under the direction of the Federal men now engaged in making epidemiology studies. Daily flights will be made at various altitudes in this region. Data will also be obtained as to the presence of spores in the upper atmosphere under varying conditions, such as before and after rains. Germination studies are to be made of the spores caught in these flights at various altitudes under different conditions.

Preliminary germination studies have demonstrated that spores caught on vaseline slides in the upper atmosphere will germinate; for instance, spores caught over the Northfield area at an elevation of 200 feet and 1,5000 feet germinated vigorously, giving about 40 per cent germination.

Observations as recorded by Mr. Aamodt, Mr. Levine, and others of the stem-rust research staff, on the occurrence and severity of stem rust in parts of Colorado, Illinois, Iowa, Minnesota, Nebraska, North Dakota, Wisconsin, and Wyoming for the period June 22 to July 24 have been reported as follows:

Mr. Aamodt, reporting from Crookston on June 22, stated that the grain in that section of the Red River Valley was quite generally late and would require about two weeks to ripen. The rust on Marquis and durum wheats ranged from five to fifteen per cent infection, but much of it appeared to be just coming out. He predicted that there would be much more in a few days. If favorable weather for the wheat continued, the damage probably would not be very great.

During the course of a trip through the above named States Mr. Levine made the following observations:

Madison, Wisconsin, July 14. Rust just beginning to appear probably heavy infection in two weeks on spring wheat. Wheat in the soft dough stage-winter wheat harvested, practically no damage from rust.

Chicago, Illinois, July 15 and 16. No rust on wild grasses within a twenty-five mile radius.

Ames, Iowa, July 17. Highest percentage of infection on common spring wheat was forty-five. Wheat was in the soft dough stage. No damage on winter wheat.

Lincoln, Nebraska, July 18. Amount of rust varied from twenty to eighty-five per cent - developed since the first of the month, so late there will probably not be great damage.

Akron, Colorado, July 19. Very dry. Trace to fifteen per cent of rust. Wheat in dough stage.

Archer, Wyoming, July 20. Spring-wheat plats examined very late, for the most part just beginning to head. Trace to three per cent of rust.

Waseca, Minnesota, July 22. Spring wheat in the hard dough stage. Rust very heavy, ninety-five per cent on most of the spring wheat. Epidemic on wheat, rye, oats, barley, and grasses.

Coon Creek, Minnesota, July 23. (On peat soil, very late.) Wheat flowering to early milk stage. Marquis averaged about twenty-five per cent infection. Oat rust very heavy. Barley moderate infection. Little rust on spring rye.

Mr. Levine remarked that, in general, there seemed to be more rust in southern Minnesota than there was in Iowa. At Waseca, Minnesota, at least, very material damage was being caused by the rust, which was practically epidemic. At most of the other places where he made observations it appeared to him that if favorable weather continued up to maturity of the wheat, very serious damage would probably not result.

Returning from a field trip confined solely to Minnesota, Mr. Lambert states:

"Observations were made at St. Paul, Waseca, Morris, Grand Rapids, and Duluth. The amount of stem rust found at these stations would indicate that there will not be a general serious epidemic in this State. Considerable damage, however, may be expected in local areas, such as Waseca, and Goodhue County in the southeastern part of the State, and in New Ulm in the southwestern section. Conditions at the State experimental farms at Morris, Crookston, Grand Rapids, and Duluth would indicate that the rust could not possibly do any damage in the plats examined."

In his letter of July 24 Mr. Barker states that observations made by Mr. Fletcher of the barberry eradication force indicate that a serious epidemic of stem rust probably would not occur in the northern portion of the Red River Valley.

Mr. Wallace Butler, reporting for Minnesota for the period July 5 to 10, states: (1) That at only two out of twelve observation stations did any of the wheat fields examined show more than fifteen per cent severity of stem-rust infection. (2) That with the exception of the territory immediately contiguous to St. Paul, practically all plants throughout the observed area showed some infection. The observed area included the following stations: Faribault, Glencoe, Granite Falls, Mankato, Marshall, New Ulm, Olivia, Sleepy Eye, Tracy, Waseca, and Waterville.

Dr. Butler further reports that the percentage of infection severity varies slightly but not uniformly in any direction, and that up to July 10 the rust was almost entirely in the "red" spore stage and had not yet damaged the crop.

Volume 2, number 5, of Weather, Crops, and Markets, issued by the Department of Agriculture, reports for the week ended July 29, the occurrence of some stem rust in North Dakota and in a few localities in South Dakota but adds that the damage was slight except to some fields of late-sown grain.

NOTES ON LEAF RUST

By, Dr. E. B. Mains, Purdue University Experiment Station.

1. Severity of Leaf Rust. The leaf rust of wheat, Puccinia triticina, has been unusually severe this year throughout most of the eastern United States. The rust has been heavier and over a wider area than any year since investigations were started in 1918. In addition to the territory covered with heavy development of leaf rust last year, which included North Carolina and Tennessee, to Kansas and northward, the Southern States have suffered considerably, especially Georgia and South Carolina. Trips to Experiment, Georgia; Clemson College, South Carolina; Jackson, Murfreesboro, and Knoxville, Tenn.; Washington, D. C.; Blacksburg, Virginia; Granite City and Bloomington, Ill.; La Fayette and Wanatah, Indiana; and Madison, Wisconsin, for the purpose of securing notes on the susceptibility of wheat varieties in the varietal nurseries at those places resulted in finding susceptible varieties some of which show close to 100 per cent infection.

2. Losses Due to Leaf Rust. It is, of course, difficult to estimate accurately the loss due to the leaf rust of wheat on account of the lack of a basis for comparison. In northern Georgia and South Carolina a number of farmers were so alarmed by the rapid and abundant development of the rust before heading time that they made inquiries as to the value of rusted wheat for hay or pasturage and as to the advisability of plowing the crop under. In all cases they were advised against such measures. When visited about May 9 the wheat in this region was very heavily rusted, especially the variety generally grown, and known as Tenn. Purple Straw. The leaves had been prematurely killed, but the wheat had headed fairly well. R. P. Bledsoe stated that the rust in the region of Experiment became bad about March 1, when the wheat was beginning to shoot. He estimated that the loss was likely to be 50 per cent. At Jefferson, Georgia, County Agent, Mr. Hill Hosch, stated that the rust became severe around March 1, when wheat was about 1 ft. high. He estimated that the loss would run from 25 per cent in some fields to as high as 100 per cent in the more severely rusted ones. He expressed much concern over the situation, for, as he stated, more wheat had been planted in that county this year than in the past six together. It is evident that some years in this region the leaf rust of wheat is an important limiting factor in wheat production. Apparently there is a desire throughout this region for better systems of farming involving the adoption of crop rotation in which the land will have crops on it in the winter which will bind the soil and prevent washing, and wheat is most to be desired for this purpose on account of the value of the crop.

Throughout Virginia, Tennessee, and Kentucky, the leaf rust of wheat apparently started somewhat later than last year, yet the greater severity will probably result in as much loss as was experienced in those States in 1921. In Indiana and Illinois the leaf rust of wheat was more uniformly severe over the entire State than last year, only small areas, as around La Fayette, Indiana, where drought prevailed for three or four weeks before harvest showing moderate or light infestations of the disease. Consequently, the loss for

these States, as a whole, is likely to run higher. A few fields in southern Indiana have been reported by Chas. Gregory to be practically a complete loss where leaf rusts became heavy early when wheat was about a foot high. The estimated loss for that section of the State, according to H. S. Jackson and Chas. Gregory of the Department of Botany and W. A. Ostrander of the Agronomy Department, will probably average about 20 per cent, while for the State it is likely to run about 10 per cent. Judging by the situation at Madison, Wisconsin, southern Wisconsin had an unusual amount of leaf rust, most of the varieties at Madison showing 100 per cent of rust and many of the late spring wheats being killed by the heavy attack of the rust.

3. Varietal Susceptiblity. In the varietal nurseries at the above-named places, one thing very noticeable this year was the increase in susceptibility of a number of the varieties which in previous years had shown high resistance, many varieties being only moderately resistant where before they had shown high resistance. Thus several strains of Turkey, Beloglina, Kanred, and some of the spelts and durums showed higher percentages of leaf rust this year than hitherto, the presence of hypersensitiveness, however, indicating that there was not a complete loss of the resistant character. One strain of Turkey and several of the soft winter varieties have maintained a rather high resistance. Besides those which have shown resistance hitherto a number of additional varieties were found resistant, including one variety of durum grown by R. P. Bledsoe at Experiment, Georgia; several varieties of Italian wheats grown by Prof. Essary at Knoxville, Tennessee; a number of soft and semi-hard varieties grown at Arlington Farm, Washington, D. C., and a number of spring wheats grown by J. G. Dickson for his scab studies at Madison, Wisconsin, and Bloomington, Illinois. A number of wheats have shown only a moderate susceptibility to the rust and appear to be giving good yields. Included among these are several strains of Fulcaster, Michigan Amber, Michikoff, and Turkey.

4. Breeding for Rust Resistance. Considerable work has been started with the object of breeding wheats suitable to eastern conditions which have the resistance of some of the Crimean wheats, most especially that of Kanred. Hybrids have been made with either Kanred or P 1066, or P 1068 for the resistant parent and some suitable soft or semi-hard wheat for the other parent. A number of such hybrids were made in 1920 by Dr. C. E. Leighty at Washington and by Carl Kurtzweil at Knoxville, Tennessee. This spring work was started by C. O. Johnston for eastern Kansas conditions and by R. P. Bledsoe for Georgia. The hybrids made by Dr. Leighty Have Valley, Harvest King, Prelude, Leap Prolific, Purple Straw, Virginia, Early Genesee Giant, Treasure, Mealy, Fortyfold, Gypsy, China, Early Ripe, Fultzo-Mediterranean, Gladden, Nigger, St. Louis Grand Prize, Rising Sun, Fulcaster, Super, Velvet Chaff, Mediterranean, Jersey Fultz, New Amber Longberry crossed with Kanred, P 1066 or P 1068, Mr. Kurtzweil used P 1068 and Fulcaster. This material was divided and planted at La Fayette, Indiana; Knoxville, Tennessee; and Washington, D. C., where it was studied for its rust susceptibility by Dr. Leighty and the writer. Although the parent Kanred has not shown as high a resistance this year as hitherto, yet about 300 selections have been made from the F_2 of this hybrid which show a high resistance. Many of these show the plant characters of the soft winter parent. These will be palnted this fall and further selections made another year. From the present outlook, the possibility of obtaining by this method soft winter wheats resistant to leaf rust appears very promising.

Similar studies have been made in developing a resistent spring wheat in a Kota x Kanred hybrid furnished by J. A. Clark. Unfortunately the dry weather which prevailed at La Fayette did not afford as good conditions for intelligent selection as in the case of the winter hybrids. A number of promising selections, however, were made but will require another season and more favorable conditions to definitely determine their susceptibility.

C E R E A L C O U R I E R

Official messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 September 11, 1922 No. 21.
Personnel (Sept. 1-10) and Field Station (August 16-31) Issue.

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PERSONNEL ITEMS

Dr. Carleton R. Ball, Cerealist in Charge, left Washington on September 5 to inspect cooperative investigations of corn breeding and the control of corn diseases, in the central states of the corn belt; and to inspect other agronomic and pathologic investigations conducted in different states, and confer with experiment station officials about plans for the future.

The cooperative research projects to be covered in this trip include extensive oat and corn breeding at the Iowa station; extensive studies in the control of the root, stalk, and ear rots of corn, and the breeding of corn for disease resistance at the Illinois and Indiana stations; and at Funk Brothers Seed Company at Bloomington, Ill.; physiological investigations of the corn and wheat plants at the Indiana and Wisconsin stations; wheat scab and seedling blight investigations at the Wisconsin and Illinois stations; wheat breeding and stem rust investigations at the Minnesota station; leaf rust investigations at the Indiana station; crown rust investigation at the Iowa station; development of barberry sprouts and seedlings and chemical methods of barberry eradication at the Wisconsin station; and barberry eradication at all these stations.

He will return to Washington on or about September 22.

H. Howard Biggar, formerly scientific assistant in this Office, now agricultural editor of the Farmers' Journal-Stockman, of Omaha, Nebr., recently won a prize of $100.00 offered by the Omaha Bee for the best editorial on a subject of interest to Nebraska readers. The subject of Mr. Biggar's editorial was "Boys' and Girls' Clubs."

I. P. Blauser was appointed September 1, 1922, to assist in the barberry eradication campaign, with headquarters at Columbus, Ohio.

Walter D. Bowers was appointed field assistant in barberry eradication, with headquarters at St. Paul, Minn., effective September 8, 1922.

L. C. Burnett, in charge of cereal breeding at the Iowa Agricultural Experiment Station, and agent of the Office of Cereal Investigations, left Ames, Ia., September 9 to inspect corn experiments at Galesburg, Urbana, and Bloomington, Ill.

K. F. Burnett and Forrest J. Scrivner, field assistants in barberry eradication in Nebraska, since July 1, 1922, completed the work for which they were appointed and their resignations have been accepted, effective September 6 and August 31, respectively.

Charles E. Chambliss, agronomist in charge of rice investigations, will leave September 13, for points in Louisiana, Texas, Alabama, Georgia, Florida, and South Carolina. In the four last named States he will inspect rices grown without irrigation. These are selections made from the rices collected by Mr. Chamoliss in the West Indies in 1918 and 1919. At Crowley, La., Mr. Chambliss will spend some time at the Rice Experiment Station, and at other points in Louisiana and in Texas he will inspect fields of new rice varieties.

Earl D. Cornwell, and Ava E. Martin, field assistants in barberry eradication in Illinois, having completed the work for which they were appointed, resigned from the service August 31 and September 2, 1922, respectively.

William C. Egaers, field assistant in barberry eradication in Iowa, resigned his position August 31, 1922, in order to accept a permanent position with the Long Bell Lumber Company, of Shreveport, La.

Hurley Fellows, field assistant in laboratory investigations with take-all disease of wheat, at Madison, Wis., having completed his duties, resigned from the service September 7.

Richard L. Harrison, unskilled laborer, who since July 1, 1922, has been assisting in the cereal and flax experiments conducted at the Northern Great Plains Field Station, Mandan, N. Dak., resigned his position August 31 to resume study at Purdue University.

William L. Henning, field assistant in barberry eradication in Ohio, since July 1, 1922, has accepted a position as instructor in Pennsylvania State College and will pursue graduate studies for a master's degree. His resignation is effective September 6, 1922.

Lexemuel R. Hesler, formerly collaborator with the Office of Plant Disease Survey and more recently field assistant in barberry eradication in Michigan, having completed his field duties tendered his resignation effective September 5 and resumed his duties as professor of botany at the University of Tennessee. He has been reappointed collaborator with the Plant Disease Survey, effective September 6.

Charles O. Hinkley, field assistant in barberry eradication in Minnesota, resigned his position August 20, 1922, to accept a teaching position at Lancaster, Minn.

Daniel O. Horne, Nathaniel G. Preston and James Sazama, field assistants in barberry eradication in Wisconsin, since July 1, 1922, have completed their duties and their resignations have been accepted.

Charles L. Judson, who was appointed field assistant on July 1, 1922, to assist with the cooperative experiments in cereal production and cereal diseases at University Farm, Davis, Calif., resigned his position September 1, 1922, to resume his studies at the University of California.

R. S. Kirby, instructor in plant pathology, Cornell University, who has been assisting in epidemiology studies of black stem rust and collecting specimens of special strains of stem rust in the lower Mississippi Valley for the use of Dr. M. N. Levine, of St. Paul, has been authorized to make further collections of the same strains in Connecticut, Rhode Island and Massachusetts.

William A. Kurtz, field assistant in barberry eradication in South Dakota, since May 1, 1922, having finished the field work for which he was appointed resigned from the service August 15 to assume the duties of agricultural instructor at Geddes, S. Dak.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, attended the meeting of the Crop Reporting Board, Bureau of Agricultural Economics, September 6, as consulting specialist in connection with the issuance of the September crop report.

R. W. Leukel, assistant pathologist, who has completed the special nematode investigations conducted at Madison, Wis., for the past two years, arrived in Washington September 6 to continue his investigations on this disease and to assist in the study of the Helminthosporium diseases of barley.

William A. Lockling, field assistant in barberry eradication in Iowa since July 1, 1922, resigned his position September 4 in order to resume his college studies.

John H. Martin, agronomist in western wheat investigations, returned to Washington September 1, having spent the greater part of the summer in the northern half of the Great Plains area, particularly in North Dakota and Montana, working with hybrids of winter wheat. About 6,000 plant rows of these hybrids will be sown this fall at five experiment stations in that section to determine their hardiness and other characteristics. Mr. Martin reports that the fields of wheat in the northern Great Plains are higher than expected and that the crop is generally of good quality.

Henry F. A. North, and Severn A. Swensen, field assistants in barberry eradication in Iowa since July 1, 1922, completed the work for which they were appointed and their resignations were accepted August 26.

Martin H. Ostrom, field assistant in barberry eradication in North Dakota since July 1, 1922, resigned his position August 19 to become an instructor in the Smith-Hughes School at Beach, N. Dak.

William V. Owen, field assistant in barberry eradication, with headquarters at La Fayette, Ind., resigned his position August 31, 1922, to assume the duties of an instructor at Purdue University.

Ormley Parker, who has been field assistant in barberry eradication in Indiana since June 1, 1922, resigned his position August 31.

Jerome P. Seaton, field assistant in cereal investigations at Arlington Farm, Virginia, since July 15, 1922, completed the duties for which he was appointed and his resignation has been accepted.

Frank B. Tucker, has been appointed field assistant in barberry eradication effective September 1, 1922, with headquarters at Cromwell, Ind.

Dr. W. H. Tisdale, in charge of smut investigations, returned to Washington September 5 after a field trip of about ten days in Illinois. While at Urbana, Ill., he arranged with Prof. G. H. Dungan final plans for flag smut investigations, and at Bloomington, Ill., obtained records from the corn smut plats in which C. H. Kyle and J. R. Holbert have been cooperating.

Frank B. Tucker, has been appointed field assistant in barberry eradication effective September 1, 1922, with headquarters at Cromwell, Ind.

C. W. Warburton, agronomist in charge of cereal agronomy investigations, returned to Washington September 3 from a two-months' trip to the western half of the United States during which he visited 21 experiment stations and substations, at 16 of which cooperative experiments with cereals are under way. He reports that extremely hot, dry weather was prevalent in Kansas and Oklahoma at the time of his visit to those States and that corn and sorghum crops were being materially damaged. Good rains will be necessary before fields can be put in shape for sowing winter wheat.

Charles F. Wells, field assistant in barberry eradication in North Dakota, since July 1, 1922, has completed the duties for which he was appointed and his resignation was accepted August 31.

Allen P. Willis, field assistant in cereal investigations at the Arlington Farm, Virginia, resigned his position September 5, 1922, in order to resume his college studies.

VISITORS

Dr. Connell Boyle, research scholar from Ireland, who is pursuing post-doctorate study in the department of plant pathology, University of Wisconsin, was an Office visitor September 5.

W. E. Leer, a graduate student at the College of Agriculture of Maryland University, who is taking up graduate study in farm crops at the University of Illinois during the next year, was a visitor on Sept. 1, to discuss thesis problems in cereal agronomy.

Jean M. Lekeu, a Belgian student, who has been pursuing graduate study in the United States during the past year, and who has just completed a visit to many of the agricultural colleges and experiment stations, called at the Office September 5 before returning to Belgium.

J. P. McKnight, of the American Mission, Khartum, Egyptian Sudan, was an Office Visitor September 5 for the purpose of obtaining information regarding the culture of grain sorghums.

G. O. Ocfemia and N. G. Tecson, who were sent to the United States by the Department of Agriculture of Manila to pursue graduate study in the department of plant pathology of the University of Wisconsin, visited the Office September 5 to confer on cereal diseases.

E. S. West, of Rose Park, South Australia, who has been pursuing graduate study at the University of California during the past year, and had visited a large number of agricultural colleges and experiment stations this summer, was an Office visitor September 5 and 6. Mr. West will spend a year in European travel and expects then to return to Australia.

MANUSCRIPTS AND PUBLICATIONS.

Articles on rye and buckwheat by Dr. C. E. Leighty were approved September 5 for publication in the Young Folks' Cyclopedia of Agriculture.

Common Barberry, by Dr. E. C. Stakman, was submitted for publication September 5.

Page proof of Farmers' Bulletin 1280, The Hard Red Winter Wheats, by J. Allen Clark and J. H. Martin, was read September 2.

Page proof of Department Bulletin 1116, Seedling Blight and Stack-Burn of Rice and the Hot-Water Seed Treatment, by Dr. W. H. Tisdale, was read September 9.

Reprint of Farmers' Bulletin 1149, Growing Corn in the Southeastern States, by C. H. Kyle, with a new illustrated cover, has just been received from the Government Printing Office.

LITTLE LESSONS IN MANUSCRIPT MAKING

By the Cerealist.

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1. Too much "work." Our letters, reports, and manuscripts contain many references to "experimental work," "investigational work," "research work," "inoculation work," "culture work," "tillage work," and so forth. All of the words here used as adjectives modifying work are nouns and can properly be used as such, either in the singular or plural form. It is simpler and clearer to use them as nouns, and all members of our staff are requested to do so in the future, unless some special reason prevents.

As scientific investigation becomes more complex, there is arising a need for a series of terms which will represent the increasing degrees of complexity or difficulty. It is probable that the words, -experiment, investigation, and research, -in the order named, can be used to represent fairly well the steps in the ascending series. Already, research is recognized as a term denoting the most difficult and intensive lines of investigation.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report).

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamberly) (No report)

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor) (Aug. 21) The rye yields based upon the grain obtained from 1/20-acre plats for the crop year 1921-1922 are as follows:

Variety	C.I.No.	Yield Bu.Per.Acre	Variety	C.I.No.	Yield Bu.Per.Acre
Von Rümker	133	39.0	Invincible	-	28.6
Von Rümker	173	36.3	St.Johns	130	27.0
Abruzzes (Sel)	40-1	33.9*	Rosen	195	27.0
Virginia (Sel)	126-1	33.3	Giant Winter	30	25.4
Mexican	108	29.5	Abruzzes	40	24.1
Rimpau	126	29.0	Henry	138	23.1
Ivanof	54	32.5	Winter	208	14.7

* Average of two 1/20 acre plats; all others single plats.

Spelt and Emmer yields of 1921-1922.

The fall stands of spelt and emmer were poor, averaging not over 85 per cent for the spelts and approximately 40 per cent for the emmer. As a result the yields for the spelt were considerably below the average. The yields given represent the average for two 1/40-acre plats.

Variety	C. I. No.	Yield Bu. per acre.
Alstroum	3264	66.9
Bearded Winter	1724	66.9
Alstroum	1773	57.1
Emmer	2537	19.2

Mr. Chambliss has harvested his plats of Zizania palustris, the broad-leaved species of wild rice.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (A. H. Love) (No report).

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (Sept. 2) I had a rather interesting trip during the first week in August. I went to Covington and to points along the Mississippi River. The Acadia variety of rice is quite popular at Covington, but farmers have allowed red rice to get into their fields in spite of all that I have said each year that I have visited them. Along the river I saw many fields of Fortuna; in fact, every farmer between St. Gabriel and Donaldsonville whom I saw had 60 or more acres. The indications are that heavy yields will be obtained. Mr. Guaymard has 60 acres and expects a yield of 20 to 24 bags. There is also a rather large acreage of Acadia along the River.

For the past week or two I have visited many fields of Fortuna in this section. There are several fields of 200 acres each. In the Crowley district there are approximately 1,500 acres. The Louisiana Irrigation and Milling Company reports 1,510 acres on its canals. There are 695 acres of Fortuna under wells in this section besides small fields.

On the Kaplan canals there are 608 acres of Fortuna. I expect to go into the Elton section next week where harvesting of Fortuna was begun about the middle of August. This acreage was seeded the early part of April. I know of one farmer north of Iota who was threshing Tuesday. He was getting an average yield of 15 bags on 55 acres. Everybody is well pleased with this variety, and I see nothing to prevent it from being extensively grown in the future. There would have been much more this year if seed free of red rice could have been procured. There is evidently a large acreage in the "Teche" section, for I know that one or more carloads of seed were sold there this spring, in addition to the seed grown last year. Mr. F. C. Quereau, Manager of the American Rice Growers' Association, has 150 acres.

Mr. Kaplan's soybeans are very pretty. They average about 4 1/2 feet in height. He has ordered a harvester and expects to harvest about half for seed and make hay of the remainder. He has become very much interested in the matter of hay. I am trying to get him interested in the Barchet for this purpose and his field manager is to visit the Station soon to inspect our fields of this variety.

Work on the Station has been progressing nicely. We are rogueing for red rice for the last time today. Every now and then a stray plant is found. Water has been removed from some plats, and harvest will begin early next week.

Mr. Iang Chandrastitya, Education Department, Bangkok, Siam, has been with us for the past two weeks, familiarizing himself with our methods of investigation and incidentally studying our rice nursery and the general field practice in southwestern Louisiana.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (Sept.1) The latter half of August included the hottest days of the summer, which occurred on the 23d and 24th. Dry weather prevailed and the corn crop suffered somewhat, especially in the eastern third of the State. Along the Mississippi River, in the region of St. Louis and south, corn is in poor to very poor condition, but over the remainder of the State the condition of the crop is still good.

We are now gathering the earlier hand-pollinated ears in our breeding project. This work will continue intermittently through September.

F. D. Richey was here August 28 and 29 to discuss corn investigations.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames. (L. C. Burnett) (Sept.1) Our yields of oats are highly satisfactory, the lowest being about 40 bushels to the acre and the best something over 70. We have an average of approximately 60½ bushels per acre over the entire Station. This is very near the average of this section of the State. A small per cent of the stock will have a lower average than this, but in many sections yields justify our June and July prediction running about 71 bushels per acre. Our winter wheat yields run from 35 to 40 bushels per acre. The average being about 44.

Iowa State College, Ames (Barberry Eradication (J. H. Muncie) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report).

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (August report) In August a survey was completed in Jo Daviess, De Kalb and Carroll Counties. The men have begun work in Whiteside and Lee Counties. Four teams are now working in the first named county in order to complete the survey before the season is over.

The survey of Cook County in the vicinity of Chicago is going very slow. A large number of barberry bushes are being found everywhere. The city of Evanston was covered during August and it is hoped that every bush has been located there.

About 4,000 form letters were sent to farmers in Whiteside County, informing them that a barberry eradication campaign was being carried on in the County. A letter of inquiry was written to each postmaster in the County asking him for a list of all the routes and the number of boxes on each route and the letters were addressed to the box number. By using this method it was not necessary to sucure the names of the individual farmers. A self-addressed return franked post card was enclosed with each letter, requesting that all known plantings of common barberry be called to our attention immediately. In this way it is hoped that a number of tips may be gathered to aid the field men.

The State Leader made a number of airplane flights during the month for the purpose of collecting spores for the St. Paul

The State Leader made a number of airplane flights during the month for the purpose of collecting spores for the St. Paul Office, at Chanute Field, Rantoul, Ill., and also at Godman Field, Camp Knox, Ky. One Cross country flight was made from Camp Knox to Dayton, Ohio, and from there to Indianapolis, Ind.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report).

Botany Department, Purdue University Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson) (No report).

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer (August report). During the month of August an area equivalent to three average counties was covered in the farm-to-farm survey in approximately 289 man days with five automobiles. A total of 199 plantings were found, of which 90 per cent were removed. Three percent of the findings were in rural districts, and on four farms, escaped barberries were located.

The resurvey of six counties took 176 man-days with two cars. Eighty-five per cent of the Ohio territory covered in the farm-to-farm survey previous to January, 1922, has been resurveyed since April. A total of 450 plantings were rejected during August and only three instances of sprouts found. In locations adjacent to cultivation, it seems that the sprout problem will not be difficult to solve.

Barberry eradication demonstrations have been held at the Ohio State Fair and eight county fairs. Posters, bundles of rusted wheat, potted, purple, common, and Japanese barberries have been used for demonstration. A field assistant of the United States Department of Agriculture has been in attendance to distribute literature and answer questions, and considerable interest has been evidenced by the farmers.

Neol F. Thompson, in charge of chemical eradication, assisted by our field men, is conducting a series of experimental chemical treatments. Salt has been applied to 300 large escaped bushes near Holland and 320 escapes near Sidney were treated with kerosene. On August 30 our field men treated a large hedge near West Jefferson with kerosene.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report).

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Leo J. Federer) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)(August report). Excellent progress was made in this State in the farm-to-farm survey during the month of August. Eight counties were completed. Prospects are bright that we will finish the southeast corner of the State in the original survey. However, considerable resurvey will be necessary next year, due to the fact that that area has yielded many escaped plantings. 701 bushes were found escaped on 35 properties, besides 6,263 bushes on 212 properties. 4,565 bushes were removed.

Fair demonstration work has been in full swing during the month. Twenty-five portable fair demonstrations, the panels for which were furnished by the Conference for the Prevention of Rust, were prepared and sent out. We have made arrangements to put portable barberry demonstrations in every county fair in Minnesota this year. All these fairs are anxious to cooperate with us and helpwith this type of display. Preparations are under way for two demonstrations at the Minnesota State Fair. One of them is in cooperation with the State Department of Agriculture, and the other in cooperation with the Conference for the Prevention of Rust. The first is in the State Exhibit Building, and the second in the Agriculture Building. It is our aim in these demonstrations to point out how common barberry spreads stem rust to various grains and grasses, and thereby impress the people with the importance of eradication.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (Aug. 15). The severe drought of July was broken August 5 by a rain of 1.57 inches. Since then row crops have made rapid growth, those that had not headed during the drought have a chance to make good yields. Broomcorn, most of which was seeded during the first week of June, is heading at present and was not injured to any extent by the dry weather. It promises to be a good crop with fair to good quality of brush. Should normal conditions prevail for the remainder of the growing season, sorghums and broomcorn in the later date-of-seeding plats should make high yields.

Over 2,000 bags have been used to date for selfing heads. Birds have been very destructive to the early maturing plats and shooting does not keep them from the plats for long. The bird damage will be greater this year than it has been before.

Broomcorn in the first date-of-seeding experiment, the varietal plat of an early broomcorn, and the nursery row of the same variety were harvested yesterday. Most of the broomcorn will be ready to harvest in about one week.

Almost all sorghums seeded before or during the earlier part of June are heading at present. Many of the sorghum hybrids of the F_2 and F_3 generations are headed and heading and should give interesting results. Hybrids of Kafir x milo F_4 are heading and there is a good chance to obtain a straight-necked milo from this material.

Maximum temperature, 106°, Aug 2; minimum, 63°Aug. 5. Precipitation to date 2.16 inches from August 5 to 9, inclusive.

(Sept.1) The weather of the last half of August has been dry and at times extremely hot. At present row crops are drying ripe or merely drying up. In spite of the drought certain of the plats and varieties of both sorghums and broomcorn will yield as high as the eight-year average yields. Most of the broomcorn has been harvested although several later lots remain to be harvested. Feterita and Sudan grass in the earlier date-of-seeding experiments were harvested.Aug. 15. To-day, Sept. 1, five varietal plats of grain sorghums were harvested. The kafirs and milos are ripening rapidly, while the late varieties will not mature normally unless conditions change soon.

Messrs. Hallstead and Getty of Hays, Kans., visited this Station on the 16th. C. W. Warburton, of the C. I. Office, and J. H. Parker of Manhattan, Kans., were Station visitors on the 25th.

Maximum temperature for last half of August 109.5°, Aug. 24; minimum, 64°, Aug. 26. Precipitation for last half of Aug. 0.15 ins. Total for August 2.31 inches.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (July report)

Weather and Crop Conditions in Kansas for July.

First Week: Heavy rains occurred in the eastern two-thirds, light showers in the western one-third of the State. Corn was reported as being in good to excellent condition. Wheat harvesting was practically completed in the south and south-central counties and had begun in the western third. Threshing wheat was started in the southeastern quarter of the State. The barley crop was short because of the dry spell in June.

Second Week: Heavy rains of from one to five inches occurred in the northeastern quarter and in many central counties, with light showers elsewhere in the State. Corn continued its rapid growth and was in good condition. Harvesting of wheat was about completed in the eastern half and about half done in the western counties. Harvesting and threshing were somewhat delayed by the wet weather.

Third Week: Rains of from one to three inches occurred in all but the northwestern counties, which had light showers. Temperatures of 100 to 106 degrees occurred in the northwestern counties. Corn continued its rapid growth and was considered in good to excellent condition. Threshing of wheat was further delayed due to wet weather. In several eastern counties some wheat had sprouted in the shocks, while much of the stacking was done under unfavorable conditions. This probably will produce considerable damaged wheat.

Fourth Week: Showers were general over the State. Temperatures of 100° and higher were reported from many points in the western half with the highest, 107° at Tribune, on July 21. Corn was rated as good to excellent.

Weather Conditions at Manhattan for July.

Measurable precipitation occurred on ten days and the total for the month was 6.06 inches. Minimum temperature 51°, July 4; maximum, 97°, July 29.

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Yields of Winter Wheat and Rye Varieties Grown in Replicated Rod Rows Agronomy Nursery, Kansas Agricultural Experiment Station Manhattan, Kansas -1922.

Kans. No.	C. I. No.	Name	Bushels per acre
		Winter Wheat Varieties (* Soft Wheats)	
341		Kansas	*46.47
312		Wheeler Awnless	*46.37
367		Turkey X Harvest King (Colorado Awnless Cross)	46.37
2415	5679	P1066	47.30
2414	5680	P1065	46.93
	1442	Kharkov	46.63
343	6251	Blackhull	46.17
2123	6214	Defiance Hard Winter	45.30
55		Fulcaster	*45.23
350	6467	Station Red	44.97
2472	5549	Kharkov (Mont. #36)	44.07
2401	5146	Kanred	43.61
2250	1563-30	Karmont	42.20
		Kharkov Kansas #382	41.87
2382	5592	Improved Turkey	41.23
326	6156	Bacska	41.03
416		Kharkov (Hays #2)	40.60
400		Fulcaster Sel. (Penn. #44)	*40.00
19	6199	Harvest Queen	*39.93
2195	5170	Eureka	39.97
322	6250	Neb. #60	39.33
321	6249	Neb. #6	39.30
570	1558	Turkey	38.70
2446	6155	Minturki	*38.50
2064	6211	Zimmerman	*38.20
2156	6215	Filtz	*37.60
2048	5797	Alberta Red	36.70
347	6676	Iowa #1946	36.03
34	5147	Nebr. #28	* 34.97
2450	5149	Minhardi	*34.27
365		Ghirka Winter (Alton)	33.00
315		Mediterranean	*29.50
2465	6151	Odessa	*26.03
2331	3330	Buffum #17	*25.80

Kans. No.	C.I. No.	Name	Bushels per acre.
		Rye Varieties.	
9075		Kansas Common	53.47
9077		South Georgia	53.27
9074	195	Rosen	53.10
9073	40	Abruzzi	52.40
9084		Advance	51.53
9085		N. D. #959	49.30
9081	108	Mexican	48.60
9079		Mammoth White	47.83
9076		Virginia Rye	47.80
9083	178	C. I. 178	44.80
9082	194	Silesian	44.57
9080	130	Johannis	42.03
9071		Minn. #2	39.97

Yields of winter wheat and oat varieties grown in the plots at the Agronomy Farm will appear in a later issue, well as the results of the 1922 cooperative experiments with farmers.

Several pure-line selections from Kanred and P1066, made about three years ago, appear to be superior to Kanred in yield.

A number of selections of Hard Winter Defiance, made several years ago, seem to be equal to Kanred in yield, but are not rust-resistant. At least one of them is earlier than Kanred.

Ten pure-line selections of Alberta Red (Kansas No. 2048) are being continued in the nursery. Most of these do not yield quite so well as Kanred, but produce dark hard grain of remarkably fine appearance, and with very little yellow berry.

Eighteen awnless selections from the cross, Kharkov X Ghirka, were grown in the 1922 nursery, but only eight of them are sufficiently productive to warrant further trial.

Sixty-one bearded, winter-type selections from the winter X spring-wheat crosses were grown in the 1922 nursery. These 61 strains made an average yield of 40.98 bushels, compared with 45.32 bushels, the average of seven Kanred checks, in the same section of the nursery. Thirty-one of these bearded hybrids which made the highest yields will be given further trial.

Three hundred and six winter-type, awnless selections from the winter X spring-wheat cross (a majority of them Kanred X Marquis) were grown in replicated rod rows in the 1922 nursery. The average yield of these 306 strains was only 36.90 bushels, while the yield of 35 Kanred checks grown in adjacent rows was 47.98 bushels. However, 129 of the 306 hybrid rows made high enough yields to warrant further trial in nursery rows at Manhattan and other stations. Many of the higher-yielding rows produced plump grain of exceptionally good quality with high-test weight. Several of these new awnless winter wheats have the short kernel, and, it is hoped, the fine milling quality of their Marquis parent.

Messrs. C. O. Johnston and C. W. Bower have made a large number of self pollinations in the corn-disease plots. The selfed lines of Pride of Saline, Commercial White, and Kansas Sunflower corn, as well as those received from the Indiana and Connecticut stations, and from Mr. Kyle, contain a number of very interesting types.

Threshing, cleaning, and note-taking on the samples of the winter wheat grown in the 1922 nursery have been completed and planting lists are now being made up.

Nearly all of the sorghum varieties and hybrids at the Agronomy Farm have headed and counts of plants and stalks and of smut heads have been completed. In the nursery rows containing about 100 F_3 lines of the Red Amber X Feterita cross, the check rows of Red Amber parent averaged 18 per cent kernel smut, while check rows of Feterita were smut free. The majority of the hybrids were also free of smut, although some of them were rather heavily smutted, the highest percentage being 49 per cent.

H. N. Vinall, of the Office of Forage-Crop Investigations, visited the station on August 15 and 16. E. B. Brown, of the C. I. Office, was here on the same dates.

Hays Branch Experiment Station, Hays (A. F. Swanson) (Sept.4) The weather during August was unusually dry and windy. The rainfall was only 0.67 of an inch, which fell during four showers. Because of lack of rainfall it has been impossible to work down the seedbed for wheat. Farmers have done less plowing this fall than usual. Considerable disking has been done, however.

The commercial fields of sorghum on the Station withstood the drought remarkablywell. Pink kafir, Dawn kafir, and Feterita will average from 30 to 40 bushels to the acre.

Most of the experimental plats of sorghums were harvested last week, which is fully two weeks earlier than usual. A few of the late varieties of sorghums will make but a light crop. During the last week a large number of selections of sorghumshave been made for next year's planting.

The following were visitors at the Station: C. W. Warburton, of the C. I. Office, H. N. Vinall of the Office of Forage-Crops Investigations, Prof. L. E. Call and J. H. Parker, of Manhattan, Supt. E. F. Chilcott, of the Woodward (Okla.) Field Station, and Supt. B. F. Barnes, of the Colby Branch Station, Colby, Kans.

In company with Mr. Getty, of the Office of Forage Crops Investigations, the writer visited the Tribune Branch Experiment Station and the cooperative work done by A. R. Baker of Sharon Springs, Kan. This work is carried on in extreme western Kansas. Gratifying results were obtained with feterita, milo, freed sorgo, and red and black amber. Pink kafir also did well on the Baker Ranch, but did not withstand the climatic conditions at the Tribune Station. The value of the cooperative work done on the Baker ranch has been much appreciated by the local farmers. In a number of instances the farmers of this section were growing from three to five of the leading varieties of sorghums under field conditionsk thus distributing their risk.

COLORADO

Akron Experiment Farm, Akron (F. A.Coffman) (Aug.16-31) Weather conditions during the latter half of August were favorable to threshing operations , and most of the wheat in this section has been threshed. Very little moisture has been received during the past two weeks and the temperatures have been higher than normal. As the result of these conditions corn and the sorgos have ripened very rapidly. Most of the sorgo in this section has already been cut. Corn cutting started on the Station the last of August. This dry weather is not encouraging for the early seeding of winter wheat. Last season many of those who did their seeding in August found it necessary to reseed in October because the early-sown wheat sprouted and died from lack of moisture.

Farming operations at the Station have progressed favorably during the past half month. Threshing of small-grain plats and nursery was completed. For the most part the yields of spring wheat, oats, barley, and rye were well up to expectations. The yields of winter wheat were on an average nearly 25 per cent lower than was expected. This was apparently due to a large percentage of empty glumes since the yield of straw, length of spikes, and bushel test weights were all above the average for the crop at Akron.

Seeding of the 1923 experiments started August 17. The first seeding of the rate-date experiment was made on that date. Due to the dryness of the seed-bed the plants are emerging very slowly on the fallow and not at all on the corn ground. The second seeding in this experiment was made Sept. 1.

C. W. Warburton visited the Station August 19 and 20, going over the experiments and outlining the work for the future. Professors E. J. Maynard, E. C. McCarty and Alvin Kezer of the Colorado Agricultural College, and O. J. Grace, former Superintendent of the Akron Field Station, now County Agent of Kimball County, Nebraska, were visitors during the latter half of August.

(Sept. 1) Nearly 5,000 plats and rows of grain have been grown at Akron this year in addition to the several thousand plants which have been given individual attention. As a whole this has been by far the most satisfactory of the six seasons I have been at Akron, from the standpoint of results obtained.

I am mailing herewith, the yields from the some 460 plats of small grains grown on our projects at Akron this season. The yields are not as high as in some of the previous seasons, but taken as a whole they are up to the average for this station. It is yet a trifle early to predict very accurately what our corn and grain plats will yield, but I believe that we can expect yields which will be in excess of the average for these crops here.

One of the most pleasing features of the past seasons results is that in all of our crops some of our selections outyielded the standard varieties. The new Kharkov winter wheat selection C. I. No. 6666, from Hays, was our best yielder among the winter wheat varieties, and several of the Alton (Ghirka Winter) selections outyielded the parental variety by several bushels to the acre. Among the spring wheats a variety introduced from Algiers ranked first among the durums, while a selection from Arnautka made by Mr. Clyde McKee came second. Early Baart yielded best among the common spring wheats and Hard Federation ranked second in that group. The Arnautka selection made by Professor McKee was our highest yielding spring wheat last year. It is earlier in ripening and has shorter straw than the parental variety.

Following are the yields of winter wheat varieties grown in four fiftieth-acre plats, two on fallow and two on cornstubble, at the Akron Field Station, in 1922.

Winter wheat

Variety	C. I. No.	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver. of variety
Crimeans.								
Kharkov	6606	23.3	13.7	18.5	7.5	16.9	12.2	15.4
Kharkov	1442	25.3	14.2	18.7	6.7	16.9	11.8	15.3
Kharkov	5349	21.0	15.0	18.0	7.7	15.0	11.3	14.7
Kanred	5146	20.8	18.3	19.5	8.2	13.1	9.6	14.6
Kharkov	1563	20.8	19.2	20.0	5.8	11.2	8.5	14.3
Kharkov	4207	16.3	-	16.3	7.9	-	7.9	13.1
Karment	6700	19.6	13.3	16.4	5.8	13.1	9.4	12.9
Turkey	1571	16.9	17.5	17.2	5.8	10.8	8.3	12.8
Crimean	1436	13.3	15.0	14.2	5.7	10.6	7.2	10.7
Blacknull	6251	11.9	7.5	9.7	7.9	8.3	8.1	8.9
Misc.								
Alton	1438	16.9	15.4	16.1	3.7	9.6	6.6	11.4
Minturki	6155	13.3	7.5	10.4	6.5	9.4	8.0	9.2
Buffum	3330	-	9.2	9.2	-	6.7	6.7	8.0

Rate and Date, Winter Wheat.

Yields obtained in a rate and date of seeding experiment with Kanred (C. I. No. 5146) winter wheat sown on fallow and cornstubble at the Akron Field Station, in 1922.

Dates.	Rate pecks.	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Aug. 16	1	6.2	13.7	10.0	6.5	5.5	5.0	7.5
	2	13.3	14.6	14.0	7.1	4.8	5.8	9.9
	3	15.4	17.7	16.6	10.8	7.9	9.4	13.0
	4	19.0	20.2	19.6	20.6	5.4	13.0	16.3
	5	25.0	22.1	23.6	23.3	7.1	15.2	19.4
Sept. 1	1	17.5	20.8	19.2	16.7	7.0	11.9	15.5
	2	19.2	20.4	19.8	20.0	6.2	13.1	16.5
	3	20.4	22.9	21.6	21.0	6.2	13.6	17.6
	4	20.2	22.7	21.4	20.0	5.0	12.5	17.0
	5	23.7	22.9	23.3	20.0	8.3	14.2	18.7

Some of the barley selections from White Smyran gave exceptionally good results. These selections were made in 1920, and were grown in plats for the first time this season. Several of the oat selections gave favorable yields as compared with the standard oat varieties. The Burt oat which has been grown at Akron for many years was recently found to have originated as a selection from Burt C. I. No. 293, made in 1909 by Mr. Wilson G. Shelley. This is one of our very highest yielding oat varieties at Akron.

The results obtained in our nursery experiments with all of the various crops are fully as encouraging as the results obtained from the field plat seedings. Many of the winter wheat selections outyielded the checks. One selection from Kanred made in 1921 because of its early maturity, bred true for that character this season. The general characters of this selection appear to be similar to those of Kanred, with the exception that it is from three to five days earlier in maturing than Kanred. It has been observed that the barley variety, Blackhull, C. I. No. 678, is apparently genetically heterozygous for the character glume color. The black color of the glumes appears also to be closely linked with a black color which developes in the leaf blades during the later stages of maturity of the plant. A number of selections have been made from Blackhull which show very little of the pigment in the glumes. This variety is a valuable one on account of its early maturity, but has had the objectionable feature of black color. A white or nearly white selection would probably be of value in this section.

This year's results in the selection of sorghum are by far the most satisfactory we have ever obtained. Several of our selections appear to be what we have been looking for, an early maturing grain sorghum which will produce a good yield of grain and retain its leaves until the grain is mature. A selection of Dawn kafir will probably be ripe enough to harvest by September 15, while the original variety will very likely not be mature before our average first frost date, which is about the last of September.

The corn work on the station has resulted in the production of at least one variety which appears better than those formerly grown. This variety has been named Akron White. During the past four seasons this selection has outyielded our standard variety, Wyadley, by an average of nearly 10 bushels to the acre. At the present time it looks very much as though this selection will outyield all other varieties in our corn varietal experiment. A recent letter from Mr. E. B. Brown states that this selection is making a very good showing at Hays, Kan., Last season the selection made fair showings at the Archer, North Platte, and Colby stations.

Dates.	Rate pecks	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Sept. 16	1	21.7	15.0	18.4	20.2	13.1	17.0	17.6
	2	18.7	15.4	17.0	18.3	14.6	16.4	16.7
	3	20.0	20.8	20.4	13.3	13.7	13.5	17.0
	4	18.7	20.8	19.7	12.7	13.3	13.0	16.4
	5	18.3	19.2	18.7	13.5	15.0	14.3	16.5
Oct. 1	1	12.3	12.9	12.6	7.1	10.2	9.0	10.8
	2	13.7	15.8	14.8	7.1	13.3	10.2	12.5
	3	14.8	18.7	16.7	7.5	12.5	10.0	13.4
	4	13.0	18.3	16.6	7.1	12.1	9.6	13.1
	5	16.9	19.2	18.0	7.1	12.5	9.8	13.9
Oct. 16	1	13.3	15.0	14.1	5.0	6.7	5.8	10.0
	2	15.8	16.9	16.4	5.0	10.0	7.5	11.9
	3	16.9	17.5	17.2	5.0	10.2	7.6	12.4
	4	19.0	18.3	18.6	6.4	11.7	9.0	13.8
	5	22.1	16.7	19.4	7.9	13.3	10.6	15.0

Yields obtained in varietal experiment of spring wheat varieties grown on fallow and cornstubble at the Akron Field Station, in 1922.

Variety	C.I.No.	Spring Wheat. Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Durum								
	3145	14.6	-	14.6	10.8	-	10.8	12.7
Arnautka sel.	1493-7-12	12.9	12.9	12.9	6.7	8.3	7.5	10.2
Monad	3320	12.7	10.8	11.7	6.2	8.7	7.5	9.6
Kubanka	1440	12.3	10.0	11.2	9.2	6.9	8.0	9.6
Beloturka	1520	-	10.8	10.8	-	8.5	8.5	9.6
Arnautka	1493	11.2	10.4	10.8	7.1	8.3	7.7	9.2
Acme	5284	10.6	10.4	10.5	6.5	7.9	7.2	8.8
D-5	5322	10.4	10.0	10.2	7.9	6.7	7.3	8.7
Peliss	1504	9.6	9.8	9.7	5.4	6.7	6.1	7.9
Arnautka	4064	8.7	7.3	8.0	6.7	7.1	6.9	7.4
Kahla	5329	5.6	8.1	6.9	6.7	7.9	7.3	7.1
Mindum	5296	9.6	10.4	10.0	7.3	5.6	6.5	8.2
Common								
Early Baart	1697	16.7	13.3	15.0	9.6	11.2	10.4	12.7
Hard Federation	4733	12.1	13.3	12.7	10.0	10.2	10.1	11.4
Kota	6248	13.3	12.7	13.1	9.8	9.4	9.6	11.3
Red Bobs	6255	13.3	12.1	12.7	9.6	9.6	9.6	11.1
Converse	4141	12.7	11.0	11.9	9.4	10.0	9.7	10.8
Ruby	6047	12.1	11.2	11.7	9.0	9.6	9.3	10.5
Pioneer	4324	11.8	12.1	11.4	7.3	7.1	7.2	9.3
Prelude	4323	11.7	9.8	10.7	7.5	7.1	7.3	9.0
Kitchener	4087	7.9	9.6	8.8	5.4	6.2	5.8	7.3
Marquis	5641	8.1	8.7	7.4	5.3	4.2	4.8	6.3

Winter Rye.

Variety	C. I. No.	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Giant Winter	30	22.8	22.8	22.8	12.1	6.7	9.4	16.1
Rosen		32.1	16.1	24.1	10.7	9.8	10.2	17.1

Spring Emmer.

Khapli	4013	-	21.1	21.1	-	8.2	8.2	14.7
White Spring	1524	13.0	15.6	14.3	7.8	-	7.8	11.0

Yields obtained in a varietal experiment of oat varieties grown on fallow and cornstubble at the Akron Field Station, in 1922.

Spring oats.

Variety	C. I. No.	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Fulghum	708	35.5	39.1	37.3	21.9	25.8	23.8	30.5
Burt	293	32.8	39.1	35.9	18.7	22.6	20.6	28.2
Aurora	631	35.9	32.0	33.9	20.3	20.3	20.3	27.1
Kherson	459	27.3	32.0	29.6	24.7	19.1	21.9	25.7
Kherson	459-6-2	28.9	29.9	29.4	19.5	19.5	19.5	24.4
Albion	729	33.8	26.9	30.3	16.3	18.4	17.3	23.8
Kherson	459-6-1	28.5	31.1	29.8	16.4	15.8	16.1	22.9
Neor. No.21	641	25.8	28.9	27.3	15.6	16.0	15.8	21.5
Black American	649	16.8	16.4	16.6	10.1	7.0	8.5	12.5
Swed. Select	134	12.5	-	12.5	6.6	-	6.6	9.5
Golden Rain	493	7.3	-	7.3	6.8	-	6.8	7.0
Colo. No. 37	617	-	7.4	7.4	-	3.9	3.9	5.6
White Tartar	300	-	4.1	4.1	-	1.9	1.9	3.0

Yields obtained in a varietal experiment of barley varieties grown on fallow and cornstubble at the Akron Field Station, in 1922.

Spring Barley.

Variety	C. I. No.	Fallow 1.	Fallow 2.	Fallow Ave.	Cornstubble 1.	Cornstubble 2.	Cornstubble Ave.	Aver.
Blackhull	676	32.3	31.3	31.8	30.3	24.5	22.4	27.1
White Smyrna	195*	-	32.3	32.3	-	20.1	20.1	26.2
White Smyrna	195	25.0	30.7	27.8	20.3	18.7	19.5	23.6
Baku	709	8.9	-	8.9	14.6	-	14.6	11.8
Norsford	877	20.3	-	20.3	12.5	-	12.5	16.4
Himalaya	620	23.8	-	23.8	11.5	-	11.5	18.1
Orel	351	17.3	-	17.3	11.5	-	11.5	14.4
Hannchen	602	15.6	-	15.6	11.5	-	11.5	13.5
Coast	690	29.2	30.7	29.9	14.6	16.7	15.6	22.7
Nepal	535	15.6	-	15.6	10.4	-	10.4	13.0

*C.I. No. doubtful.

Agricultural College, Ft. Collins, (Barberry Eradication, John R. Fitzsimmons) (No report).

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report).

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report).

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (No report).

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (No report).

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report).

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayous) (August report) During the month of August, a survey of approximately seven counties has been completed. The counties entirely completed since July 1 are Bottineau, Rolette, Towner, McHenry, Wells and Hettinger, and those counties partly completed for the same period are Benson, Emmons, Sioux, Grant and Morton. At the present time, the field work is in Emmons, Sioux, Morton and Grant counties, and our next move is to Sheridan, Kidder and Burleigh.

A resurvey has been conducted in the northern half of Barnes County, in the rural and urban districts, and in Fargo.

Sprouts have been located on most of the properties where bushes had been eradicated during the first years of the campaign, 1918-1919. This fact proves that a resurvey is necessary of all properties on which bushes have been eradicated. Sprouts have been located on properties where the best eradication had been made, according to Dean Bolley's statement.. No sprouts or seedlings have been found on the properties on which bushes have been eradicated since 1919. However, just a few have been resurveyed.

Twenty-two bushes on five town properties and 405 bushes on 25 rural properties have been located and destroyed during the month of August.

Demonstrations were made at the Missouri Slope County Fair at Mandan, Morton County, at the Slope County Fair, Amidon, Slope County, and the Interstate Fair at Lemmon, S. D. The demonstations at these fairs aroused more interest than was shown at any of the other fairs this season. The best interest was shown at the Interstate Fair at Lemmon, S. D. Besides the demonstartions at the fairs, demonstations also were made in eight places where bushes were located. The State Leader or the assistants, who happened to be in the community where the find was made, made the demonstration, showing the relationship of the barberry to the black stem rust in the adjacent fields and teaching the identification of the barberry. These community demonstrations proved very successful and the attendance ranged from 15 to 175 people.

As much publicity as possible has been made by the town, county and State newspapers. Local publicity has been our feature this month.

Dr. Humphrey and Dr. Kempton spent Monday, August 23, at Agricultural College.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (Sept. 1) The weather of the last half of August, though very dry, has been favorable for ripening of crops, harvesting, and threshing.

Wheat, oats, barley, and flax in the varietal plats, and flax in the date-of-seeding-and-tillage experiment were threshed Aug. 21, 22 and 23. Average yields in bushels per acre are as follows:

Wheat			Oats		
Variety	C.I.No.	Yield.	Variety	C.I.No.	Yield.
Monad	3320	20.3	Victory	560	47.8
Red Bobs	6255	20.0	Golden Rain	493	46.7
Kubanka No.8	4065	20.0	Swedish Select	154	46.3
Mindum	-	19.9	Sixty Day	165	40.8
Kubanka No.74	-	19.8	Early Mountain	656	35.4
Kubanka No.1	1440	19.6	White Russian	531	21.4
Kubanka No.98	6519	19.2			
Kota	6248	18.6			
Acme	5284	18.6			
Power	3697	18.5			
Hard Federation	4733	18.1	Barley		
Preston	3061	17.5	Hannchen	531	45.5
Marquis	3641	16.7	Svanmals	187	43.3
Ruby	6047	16.4	Coast	690	42.1
Beliss	1584	16.0	White Smyrna	195	40.8
Arnautka	4064	16.0	Manchuria	554	39.8
			Mariout	261	33.5

Flax		
Reserve	19	7.4
Damont	3	6.5
Primost	12	6.4
N.D.R. No.52	8	5.8
N.D.R. No.114	13	5.5

J. H. Martin of the C. I. Office was here Aug. 24 to arrange for the sowing of a winter-wheat nursery.

Maximum temperature for the last half of August, 95°, Aug. 22 and 23; minimum, 45° Aug. 24; precipitation, 0.07 in.

Robert L. Davis, of the Office of Fiber -Plant Investigations, was a visitor Aug. 17.

Dickinson Substation, Dickinson (Ralph W. Smith) (Aug. 31) Dry, hot weather has prevailed during the latter half of August. The temperature reached 99 degrees today, the maximum for the month. A few light showers have occurred but scarcely enough to check threshing operations. The threshing of all cereal plats is finished with the exceptions of the increase plats, which are being threshed. Threshing in this vicinity is making good progress, and good yields of all cereal grains are reported.

An educational exhibit is being prepared by the Substation for the Stark County Fair, to be held Sept. 4, 5, and 6.

Official visitors at the Substation during the past two weeks were J. M. Stephens, Supt of the Northern Great Plains Field Station at Mandan, N. Dak., A. C. Dillman and J. C. Brinsmade of the C. I. Office and Miss Fleming, of the Office of Dry-land Agriculture. John H. Martin finished planting his winter-wheat hybrids in the nursery Aug. 23, and left for Mandan on Aug. 24.

The yields of all cereal crops were better than usual this year, and those of winter wheat the best ever obtained at this substation. Oat yields ranged from 64.6 bushels for White Russian, to 90 bushels for Lincoln. Barley yields ran from 55.9 bushels for Nepal, to 57.7 bushels for White Smyrna(S.Dak.Sel. No.26-14-15). Flax yields can not be accurately determined until the seed is cleaned, but the best yields will be slightly under 20 bushels per acre.

The yields obtained from varietal plats of spring wheat, winter wheat, and winter rye are given below. These yields are subject to slight changes when they are checked more thoroughly and the probable error determined.

Yields obtained in 1922 from spring wheat grown in triplicated 1/4nd acre plats.

SPRING WHEAT DURUM

C. I. No.	Variety	Yield (bu.per acre.)
6519	Kubanka No. 98	34.9
6518	Kubanka No. 58 (Red Durum)	34.4 p
	Kubanka No. 99	34.2
	Kubanka No. 117	33.9
	Kubanka No. 132	33.8
	Kubanka No. 94	33.3
5520	Monad	33.2
5522	D-5 (Red durum)	32.1
	Kubanka No. 133	31.9
	Kubanka No. 74	31.6
	Kubanka No.144(Bearuless)	31.5
1440	Kubanka	31.4
5264	Acme	31.2
1364	Pelissa	30.7
4063	Kubanka No. 8	30.5
	Kubanka No. 34	30.4
5256	Arnautka	29.6
4064	Arnautka	29.2
	D-40 (Red durum)	29.0
5525	Kamla	29.0

COMMON

C.I.No.	Variety	Yield(bu. per acre)
3641	Marquis	31.6
	Reasask	31.6
5878	Kota	31.0
	Kota Sel.No.2	30.6
6047	Ruby	29.7
4733	Hard Federation	29.7
3697	Power Fife	28.9
4600	Kitchener	27.5
3081	Preston	27.3
6255	Red Bobs	26.6
3022	Rysting Fife	22.5
2674	Haynes Bluestem	22.0
3329	Red Fife	21.2
	Early Triumph	20.3 b

b Only one plat.

Selections grown in single 1/56-acre plats.

DURUM

Beardless durum (K-144	38.1	K-98	32.5 c
K-97	37.6	K-31	27.1
K-127	37.3	Kota (2 check plats)	28.3
K-138	37.1	Kota Sel. 2	30.1
Monad (Av. of 2 check plats)	37.0	Kota Sel. 5	29.2
K-57	35.9	Kota Sel. 16	29.9
K-47	35.8	Kota Sel. 25	29.1
K-74	34.4	Kota Sel. 33	31.5
Kubanka C.I.1440(2 check plats)	34.3	Kota Sel. 41	32.1
K-65	33.5		
K-45	33.0		

c Yield not comparable; one half of plat reseeded.

Winter wheat varieties sown in duplicate 1/40-acre plats in standing corn on August 22, 1921.

Variety	Yield(Bu.per Acre)	Variety	Yield(Bu.per Acre)
Kanred	44.4	Karmont	38.8
Turkey	40.3	Kharkov	37.9
Beloglina	39.4	Buffum	37.7
Minhardi	39.0	Minturki	35.5

Winter and spring rye grown in duplicate 1/66-acre plats on disked millet stubble.

Advance	44.7	Swedish	34.0
N. Dak. 959	40.6	Rosen	28.2
Sel. No. 5, N. Dak. 959	36.2	Russian	26.5 d
		Spring Rye	26.5 d

d Single Plats.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Aug. 31) The precipitation during August has been 0.41 of an inch as compared with 1.44 inches as an average of 25 years. Temperatures have averaged a little above normal.

The dry weather has permitted continous harvesting and threshing. Perhaps 50 per cent of the threshing throughout the Judith Basin has been completed. The grain which remains standing was becoming so dry that grain fires along the railways were a common occurrence, but a heavy shower today probably will lessen this menace.

Most farmers have been forced to sell their grain at the present low market price because of financial difficulties, but the few more fortunate farmers are storing their grain for higher prices.

On the substation the threshing of the commercial fields and a part of the rotations has been completed. The threshing of the rotations will probably be completed today and then the crew will be ready for threshing the plots under the Cereal Project. Mr. Briggs and I have finished threshing the winter-nursery material and are now cleaning, weighing, and recording it in preparation for seeding the fall nursery. All of the spring-nursery material is under shelter but not threshed.

No fall seeding has been done. It is not advisable to do any fall seeding for ten days or two weeks on account of the grasshopper menace. However, the grasshoppers are not so active as they were two weeks ago. I stated in my report two weeks ago that there was a possibility that we might not be able to save the corn from the grasshoppers, but it now appears that we will be able to do so.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens (August 17) The rain delayed our threshing for several days, but we are now threshing the nursery and we will finish it this week. Harvesting in the county has been resumed and most of it will be completed in about ten days.

(August 19.) We finished threshing the nursery today. Our wheat is all in the seed room and most of the straw is hauled. We are now ready for fall seeding.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (Aug. 31) The weather during August has been cooler than normal. This has had a tendency to delay the heading of rice in the Valley. The commercial fields of Colusa and Sutter Wataribune are now heading and No. 1600 and Onsen are fully headed.

The early and midseason varieties are pretty well headed and some of the late varieties are just starting to head at the Station. The heads are quite short so that yields probably will be low.

The same variety of rice is heading at about the same time in deep and shallow water, and there is a difference of only about 5 days in the heading date of the same variety sown April 25, and May 25.

With normal weather during September the early varieties will be ready to harvest between Sept. 25 and Oct. 1., and the midseason varieties about October 7 to 10th.

University Farm, Davis (W. H. Florell)(No report).

Agricultural Experiment Station, Berkeley (W. W. Mackie) (No report).

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 1+ September 20, 1922 No. 22
Personnel (Sept.11-20) and Field Station (Sept. 1-15)Issue.

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PERSONNEL ITEMS

Floyd G. Anderson and Edwin D. Griffin, field assistants in barberry eradication, with headquarters at Urbana, Ill., finished their summer's work on September 15 and their appointments were terminated on that date.

Dr. C. R. Ball, cerealist in charge, writes to Mr. Warburton, from La Fayette, Ind., on September 15, concerning his experiences in Iowa, Illinois, and Indiana. The letter appears elsewhere in this issue of the Courier.

Dan L. Beals, Abner J. Brictson, Paul A. Hutton, and Paul C. Underwood, all engaged in barberry eradication in South Dakota, beginning July 1, 1922, tendered their resignations effective August 31, 1922, having finished the duties for which they were appointed. With the exception of Mr. Beals all have accepted positions as school teachers.

Jefferson S. Benner, appointed on July 1, 1922, as field assistant in barberry eradication with headquarters at St. Paul, Minn., having completed his duties, resigned on September 2 to accept a position as teacher in Minneapolis, Minn.

Ian A. Briggs, who has been assisting in the field experiments at the Judith Basin Substation, Moccasin, Mont., since July 1, 1922, has tendered his resignation and is taking up graduate studies in farm crops at the Iowa State College, Ames, Ia.

William E. Brunner, field assistant in barberry eradication, with headquarters at Lincoln, Nebr., having completed his summer's work, tendered his resignation effective August 31, 1922.

A. C. Dillman, agronomist in charge of flax investigations, returned to Washington Sept. 15, after spending the summer in the flax area of North Dakota, Minnesota, and South Dakota, with headquarters at the Northern Great Plains Field Station, Mandan, N. Dak. En route to Washington he consulted with experiment station officials at Fargo, N. Dak., St. Paul, Minn., and LaFayette, Ind., concerning flax experiments in their respective States.

Thomas J. Fitzpatrick, who was then engaged in barberry eradication in Nebraska since July 1, 1922, completed his work on September 15 and resumed his duties at the University of Nebraska.

Miss Marion A. Griffiths, assistant pathologist in smut investigations, will leave Washington September 25 for St. Louis, Mo., to conduct investigation with flag smut in the laboratory of the Missouri Botanical Garden, in connection with the field experiments at Granite City, Ill. She also will take graduate studies at the Shaw School of Botany, St. Louis, Mo.

Darrell I. Manly, Clifford F. Reed, and James A. Twamley, who have been engaged, since July 1, 1922, in the barberry eradication campaign, with headquarters at Urbana, Ill., completed their summer's work September 15 and resumed study at the University of Illinois.

Dr. H. B. Humphrey, pathologist in charge of cereal disease investigations, returned to Washington September 17 after an extended trip in Indiana, Illinois, Wisconsin, Iowa, Minnesota, North Dakota, South Dakota, and Kansas, where the cooperative investigation of a number of important cereal diseases is in progress. The extensive corn root and stalk rot studies being conducted in Illinois and Indiana were inspected and notes were taken on the satisfactory progress being made in the investigation of these and other diseases of corn. At Madison, Wis., Dr. Humphrey conferred with members of the cereal-disease staff engaged in the investigation of wheat scab and important physiologic studies on the relation of soil temperature and soil moisture to the development of seedling blight of wheat and other cereals. At St. Paul, Minn., he conferred with experiment station and other officials regarding progress in barberry eradication and in the investigation of stem rust of wheat. Points in North and South Dakota also were visited in order to review the results of experiments in the investigation of the diseases of flax and the progress that has been made in the eradication of the barberry. While at Ames, Ia., Dr. Humphrey reviewed the progress of the investigation of crown rust of oats and of the root and stalk rots of corn. At Manhattan, Kans., he consulted with the members of the cereal disease staff engaged in the study of the leaf rust of wheat and the diseases of corn and sorghum. The progress being made in the investigation of the various cereal disease problems at the several stations visited is in every way satisfactory.

Dr. Humphrey left Monday evening, September 18, for a week's trip to points in New England, New Jersey, Delaware, Pennsylvania, and Maryland to investigate the root-rot disease of corn.

Joseph G. Leman, field assistant in barberry eradication in Ohio, since August 10, 1922, tendered his resignation September 11 in order to return to his studies at the University of Illinois.

Harold L. Bandel, who was appointed field assistant in barberry eradication on July 1, 1922, with headquarters at Ames, Ia., resigned from the service September 9 to accept a permanent position.

George L. Peltier, having completed his work as field assistant in barberry eradication in Nebraska, for which he was appointed July 1, 1922, resumed his duties at the College of Agriculture, Lincoln, Nebr., and was reappointed as collaborator with the Office of Plant Disease Survey, of the Bureau of Plant Industry, effective September 1.

Donald R. Porter, Glenn O. Randall, and Lawrence A. Schaal, all engaged as field assistants in barberry eradication in Iowa since July 1, 1922, tendered their resignations to resume college studies beginning with the fall semester.

Percy Rohrbaugh, Clarence Slosson and Claude W. Thurber, who were appointed July 1, 1922, for field duties in barberry eradication, with headquarters at Lincoln, Nebr., have recently tendered their resignations and are resuming their college studies.

Hugo T. Swenson, field assistant in barberry eradication in Michigan, since July 1, 1922, tendered his resignation to take effect September 15 and returned to Michigan Agricultural College to complete a course in agriculture.

George W. Timmons, who has been engaged , since July 1, 1922, in barberry eradication in Ohio with headquarters at Columbus resigned from the service August 31, and assumed the duties of principal of the Glenmont high School.

Edgar C. Tullis, field assistant in barberry eradication, with headquarters at Lincoln, Nebr., completed his work September 12 and will begin study at the University of Nebraska.

Charles W. Van Cleve, who has been engaged in barberry eradication in Minnesota for the past two months, has resigned from the service to enter upon the duties of superintendent of public schools of Springfield, Minn.

Miss Amy G. Weedon, who has been working as field assistant in barberry eradication in Illinois, since July 1, 1922, tendered her resignation, effective September 5, in order to resume study at the University of Illinois.

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Letter from Dr. C. R. Ball, written at La Fayette, Ind., Sept. 15, 1922.

"Three days were spent in Iowa. On the first day a survey was made of the farm crops experiments, with Professors Hughes and Burnett, in company with a delegation from the Iowa Seed Growers' Association. The last two days were devoted to a discussion of our particular projects cooperative in that State. When I was about ready to leave for Illinois I suggested to Prof. Burnett that if he could spare the time it would be an excellent thing for him to make the round trip with us, and I am very glad that he was able to do this.

We had a wonderful four days in Illinois. The first day and the first half of the second were spent in Knox County around Gales burg, where County Agent Bracher has interested a large number of leading farmers in the growing of commercial crops from disease-free seed corn. In practically all cases they are growing from a few to many acres of corn from this seed obtained through the County Farm Bureau, in the same fields with the good strain of corn which they previously had grown exclusively. The comparisons are extremely interesting and instructive. In the fields grown from disease-free seed the stand is better, and the percentages of barren stalks, chlorotic leaves, and infected plants are noticeably smaller. In some cases the best estimates placed the difference in yields between fields grown from such seed and that grown from the farmer's own well selected stocks, at about 10 bushels per acre, while in extreme cases the difference was estimated by the farmer himself at as much as 35 or 40 bushels per acre or approximately 100 per cent. It is estimated that about 10,000 acres are planted with such seed in Knox County this year, and that about 75,000 acres will be planted next year, or approximately 50 per cent of the total corn acreage in the county.

Tuesday afternoon was spent in Peoria County, Wednesday at Bloomington, and Thursday on experimental farms of the University of Illinois.

The experiments at Bloomington and Urbana were in excellent condition and are yielding results of the highest value. The plots inoculated with Fusarium, with Diplodia and with Cephalosporium all showed consistent results, modified, of course, by dates of planting, by the previous rotations, and by manure and fertilizer treatments. It was a most remarkable and most encouraging demonstration of the value of this complex piece of research. We are getting splendid cooperation all along the line with Funk Bros., with the University of Illinois, and with county agents and others who are interested throughout the State.

Yesterday, September 15, was spent in an inspection of the cooperative research on the corn rots and the metal injuries here at La Fayette. While we were too late to see the fields before they had become so mature as to obscure many of the differences, there is every evidence of remarkably satisfactory progress in the work. The large volume of selfed lines both in dent and sweet corn and the large number of recombinations were very interesting. Some of the selfed pure lines here, as well as in Illinois, are almost equal to good strains of open fertilized corn.

In the inspection trip in Illinois doctors Humphrey, Johnson and Dickson were present all or part of the time, and Professor Burnett of Ames was with us throughout the entire trip, as also was Mr. Holbert. Doctors Humphrey and Johnson are here with me. Dr. Humphrey leaving tonight for Washington, and Dr. Johnson and I for Madison, where I will spend Monday and Tuesday of next week, leaving for St. Paul on Tuesday night. We are spending today here in conference with various station officials on the research projects centered here. ***** I hope to reach Washington on Friday (Sept. 22) and trust that everything has been going well with all of you."

VISITORS

Mr. A. B. Albright, of the E. I. DuPont Nemours Chemical Company, Wilmington, Del., visited the Office September 19 to confer with Dr. Tisdale concerning the tests made by him at Arlington Experimental Farm with a number of their mercury compounds.

MANUSCRIPTS AND PUBLICATIONS

Cornell Univ. Agr. Exp. Sta. Memoir 33, entitled "The Genetics of Sugar-relationships and of Inheritance in Maize, and the Relation of these to other Characters," by [illegible], was published by Cornell University Nov. 1921. This Memoir contains the results of cooperative investigations at the Cornell University Agricultural Experiment Station.

The article entitled "Some Results of the Sweet-corn Root-rot Investigations," by Dr. G. N. Hoffer, which was approved last February for publication in Journal of Agr., appears on pp. 44-45 of the May 15, 1922, issue, under the title "Improving the Yield of Corn."

An article entitled "The Relation of Temperature and Hydrogen-ion Concentration to Uredinospore Germination of Biologic Forms of Stem Rust of Wheat by C. R. Hursh, was published in Phytopathology, vol. 12, no. 8, pp. 353-361, 7 fig. (August, 1922)

The paper entitled "The Germination of Barley Seeds Harvested at Different Stages of Growth," by Dr. Harry V. Harlan, agronomist in charge, and Merritt A. Pope, agronomist, barley investigations, was published in The Journal of Heredity, v. 13, no. 2, pp. 72-75, Feb. 1922, issued September 7, 1922.

An article entitled "Rye-wheat and Wheat-rye hybrids," by Dr. E. F. Gaines and F. J. Stevenson, of the State College of Washington, appears in The Journal of Heredity, v. 13, no. 2, pp. 81-90, Feb. 1922, issued September 7, 1922.

Yearbook Separate No. 873, entitled "Wheat Production and Marketing," by C. A. Bell, Cerealist, C. F. Marbut, Agronomist, Bureau of Plant Industry, O. C. Stine, Agricultural Economist, and O. E. Baker, Agricultural Economist, Bureau of Agricultural Economics, was received from the Government Printing Office September 13.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. A. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. W. Hamerly) (No report).

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor) (No report).

NEW YORK

Cornell University Experiment Station, Itnaca (H. H. Love) (No report).

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report).

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report)

Iowa State College, Ames (Barberry Eradication (J. H. Muncie) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report).

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report).

Botany Department, Purdue University Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson) (August report) During August the survey in six counties was concluded and four other counties were completely surveyed. These latter were in northwestern Indiana and conditions for survey were almost ideal because of the level condition of the country, the lack of wooded land, and the good roads. No rust reports were received and few

barberries were found. It is evident that the newspapers have made these people familiar with the common barberry bush and the necessity of its eradication. However, that the counties have not been entirely cleared of bushes in spite of intensive local campaigns is evidenced by the situation in one of these northern counties. The county agent assured the survey team that 90 per cent of the barberry in the county was in a small hedge which he located for them. The survey netted 20 other plantings of about 550 bushes and some infection on a part of the plants.

The situation in counties in the southern half of the State is different, for rust prevails there in the vicinity of most barberry bushes. A survey of an epidemic from one of these bushes indicates that the rust has spread 3½ miles east of the bush and five miles north, and lesser distances to the south. It has reduced the yield about 50 per cent over most of this area, and nearer the bush the damage is correspondingly greater.

Demonstrations have been held at fairs in counties that are to be worked in the near future and at the State Fair. A number of rust and suspected barberry locations have been obtained from farmers at these demonstrations.

In Decatur County a field meeting at a heavily infected bush was held, and on the following day, the farmers of the immediate vicinity were organized into squads under a competent leader and the surrounding farms covered for wild bushes. Fortunately none were found.

Cooperation on the part of the Farmer's Guide, a farm paper of this State, with a circulation of 125,000, has lent a great deal of force to the campaign, and general interest has been aroused throughout the State. The majority of the field assistants stopped work about September 10, but three teams will continue work into the fall as long as the weather permits.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (Sept. 15) During the first half of September the following territory was covered by an original farm-to-farm survey: All of Wood County, three fourths of Hancock County, one half of Ottawa County, one fourth of Madison County, and one half of Union County. Towns and cities within these sections, which were previously covered by an original survey, were resurveyed. Three escaped locations were recorded. Barberry eradication demonstations were held at county fairs in Union, Wyandot, Hancock, and Wood Counties.

It is planned to do resurvey work in Lucas and Montgomery counties; to eliminate two escaped locations; and to continue the rural survey as far as possible before cold weather and bad roads make it necessary to discontinue the field work. By October 1, all but three of our field men will have resigned.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reday) August report) During the month of August 16 men were employed in the field when not nursing either infections from poison ivy or infections from barberry spines. Field Assistant Coe ran a barberry pricker into the under-side of his arm. He assumed that he had removed all parts of the barb, but after a lapse of three days he noticed his entire arm feeling sore. Without a great deal of thought he squeezed the infected place and apparently drove the poison through his entire system. He was placed under a doctor's care and confined to his bed. The doctor lanced three infections on his face, two on each arm and one on his leg. The attack rendered him so weak that it was necessary for him to resign August 21.

Poison ivy has never been found so prevalent as during the month of August. Before we select a squad of men for next summer's work it would seem logical to insist that every applicant prove his immunity to poison ivy before going to work. The following men have been poisoned more or less seriously during the past month: Ben Lafene, Harold Lewis, Carl Rigatte, Lucius Moore, and Earl Sindecuse. It may be said that these men tried every known remedy and I am certain that we are ready to publish on relative values of antidotes of poison ivy.

As we expected, the survey in Allegan County brought us into the most extensive escaped areas in the southern portion of the State. Many plantings were found and the spread by birds from these plantings was easily traced. On the Baker farm, a hedge 1,800 feet long was located. This hedge was log-tight every foot of its length with the exception of one path. Eight hundred feet of it has stood unmolested for the past 40 years; a feeble attempt had been made to trim the remainder, but this section was producing practically as many berries as the untrimmed section. Details of the removal of the hedge will be given in the September Courier.

We had the pleasure of a visit from Dr. F. E. Kempton and Noel F. Thompson during the month. An interesting trip was made to escaped areas in the vicinity of Hastings and a detailed excursion over parts of the Saugatuck region.

WISCONSIN

Agricultural Experiment Station, Madison, (J. G. Dickson) (No report)

Department of Agriculture, State Capitol annex, Madison (Barberry Eradication, [illegible] Federer) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report).

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (No report).

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (August and September reports)

First week: Soaking rains fell over much of the western half of the State, breaking a drought that was becoming serious. Corn was reported as making a good growth except where drought prevailed. Grain sorghums were doing well and were about one fourth headed. Weather conditions were favorable for fall plowing.

Second week: Dry, almost rainless, weather prevailed over the eastern two-thirds of Kansas, but most of the western one-third was favored with an abundant amount of moisture. Corn was reported as in good condition except in the northcentral counties where it was badly damaged by drought and was deteriorating. In the eastern two-thirds of the State, wheat threshing was nearly three fourths done, the stack threshing being about all that remained to be done. Grain sorghums were reported as in good condition. Fall plowing in the northcentral counties was being delayed by the hard dry condition of the soil.

Third week: The hottest weather of the season prevailed in Kansas this week with afternoon temperatures in many localities of 100 to 106 degrees. No rain fell except local showers mostly in the northeastern counties. Corn was being badly damaged in all sections, except in the extreme southeastern counties where it was nearing maturity when the dry weather began. The greatest damage was done to late corn but all corn was maturing prematurely with the result that much of it will be chaffy. The ground was hard and dry for fall plowing in all parts of the State and this work made slow progress, although from one-half to three-fourths of it had been done while conditions were more favorable. Grain sorghums were generally in head.

Fourth week: Extremely hot, dry weather prevailed with temperatures from 100 to 110 degrees in most sections. On the 25th, the weather turned somewhat cooler, with local showers, which were too late to be of any benefit to crops except in a few localities. Late corn was being badly hurt by the drought. Corn cutting had begun in all parts, except in northwestern counties and was as much as one-half done in some of the northcentral and northwestern counties. Lack of moisture in the soil and hot dry weather had almost put an end to fall plowing. Sowing wheat was begun in the northwestern section. Grain sorghums were standing the drought much better than corn but were also needing moisture.

First week in September: Some of the hottest September weather on record prevailed in Kansas. Temperatures were above 100 degrees in almost every county and ranged from 105 to 110 in many places. Corn has matured rapidly and is nearly all ready to cut. Grain sorghums have also been hurt by the dry weather, but the damage to them is not very serious except in the north central counties.

Second week in September: Soaking rains fell in the eastern half of the state and in the southcentral counties on September 8 and 9, ending the severe drought in those sections, but the western and northcentral counties still are badly in need of moisture. Temperatures of 95 to 106 degrees were common until the 9th. This was one of the hottest September weeks on record in the State. Corn has nearly all matured and cutting is mostly finished. Harvesting grain sorghums is beginning in most sections. Wheat threshing is practically finished and ground generally prepared for fall seeding. Where the heavy rains fell, the ground is now in fine shape and sowing has commenced in the western half of the State. Chinch bugs have inflicted almost as much damage as the drought in eastern sections. In the extreme southwestern counties broom corn harvesting is about done.

August Weather at Manhattan.

Measurable precipitation fell on only two days, 0.03 inch on one day and 0.07 inch on another day, making a total for the month of 0.10 inch. Maximum temperature, 110 degrees, August 24; minimum, 53 degrees, August 27. Mean maximum temperature for the month, 92 degrees; mean minimum temperature for the month 67 degrees. Mean temperature for the month, 79 degrees.

On Friday afternoon September 8, the weather turned very cool and on Friday night and Saturday there was a total rainfall of 1.52 inches. This will make possible the preparation of a good seed bed for wheat at the farm and in the nursery. The land for the winter-wheat nursery is being disked today and we expect to plant about September 23.

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C. W. Warburton of the C. I. Office, in company with the writer visited the Hays Branch Experiment Station August 21. Mr. Warburton spent August 22 and 23 at Manhattan and was accompanied to Woodward, Okla., by Mr. Parker on August 25.

F. D. Richey, of the C. I. Office, was at Manhattan, August 25 and 26, and Mr. H. B. Humphrey, of the same office, visited the Station September 5.

B. B. Bayles went to Hays on August 28 to assist A. F. Swanson in the work of the cereal project and to take charge of this work while Mr. Swanson is at the University of Minnesota pursuing graduate study during the year 1921-22.

E. R. Ausemus, senior in Agronomy, will serve as part time assistant in cooperative cereal experiments at Manhattan.

J. H. Parker spent September 8 to 11 inspecting corn and sorghums for seed in Harvey, Chase, Marion and Butler counties, for the Kansas Crop Improvement Association.

The College is putting on a very instructive exhibit at the State Fairs at Topeka and Hutchinson.

About 12 or 15 varieties and regional strains of alfalfa were seeded on September 12 in duplicate plots at the Agronomy Farm in cooperation with the Office of Forage-Crop Investigations.

The general field and the head rows of Kansas Orange sorgrum are all completely lodged. This sorghum was grown on alfalfa land and made a vigorous, succulent growth during June and July and seemed unable to stand the unusually hot drought conditions which prevailed during August.

Many of the juicy-stalked selections from the Red Amber sorghum XFeterita cross have also lodged more or less although some of them are erect and promising. Practically all of the pithy-stalked selections of this same cross have remained erect.

Yields of Winter Wheat Varieties, Manhattan, Kansas, 1942 - Replicated Plots, Agronomy Farm.

Kans. No.	Name	C. I. No.	Bushels to the acre.
2123	Hard Winter Defiance	6241	38.3
321	Nebraska No. 6	6249	38.3
322	Nebraska No. 60	6250	38.2
2302	Improved Turkey	5592	37.9
317	*Fulcaster	6471	37.6
373	Hard Winter Defiance	6205	37.5
2101	Red Winter	6213	37.2
2401	Kanred	5148	37.1
570	Turkey	1558	37.1
2472	Montana #36	5549	37.0
2406	Crimean	6206	36.5
343	Blackhull	6251	36.4
2484	Minturki	6155	36.2
2414	P1066	5680	35.9
2301			35.5
2415	P1066	5879	35.4
2406	Alberta Red	5737	34.9
204	Malakoff	6470	34.5
1604	Turkey Sel.	6472	34.5
2156	*Fultz	6215	34.4
2411	Beloglina	1543	33.6
2250	Karmont	1503-30	33.6
347	Iowa #1946	6676	33.3
2084	*Zimmerman	6211	32.9
35	Kharkof	1442	32.0
19	*Harvest Queen	6199	31.6
302	Kharkof	6206	31.1
34	*Nebraska #28	5147	30.3

* Soft wheats.

Hays Branch Experiment Station, Hays (A. F. Swanson)(Sept. 15)
Only a trace of precipitation has been recorded since Sept. 1, with high temperatures and winds prevailing.

Prospects for getting a good seedbed for seeding wheat are not encouraging. Farmers are just beginning to seed.

Seeding in the rate-and-date-of-seeding experiments was begun Sept. 8 and will continue each week until October 27 at 1, 2, 3, and 4 pecks to the acre.

All of the sorghums have been harvested. All selections of seed for next year's planting have been made. Notes have been completed on an F_2 generation of a cross between Pink Kafir and Dwarf Yellow Milo.

The writer leaves the Station tomorrow for a week's work at Manhattan, after which he will go to St. Paul to take up graduate work at the University of Minnesota. B. B. Bayles, of the Kansas State Agricultural College, will have charge of the cereal work at Hays in the meantime.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (No report)

Agricultural College, Ft. Collins (Barberry Eradication, John R. Fitzsimmons) (August report) During the month of August a resurvey has been in progress in 2c counties. Weld and Boulder counties have been completely resurveyed and where needed in portions of the other counties a resurvey has been completed.

Four new properties were located containing 175 bushes. Of these, three properties were cleared of 172 bushes. Four properties previously located were cleared of four bushes, leaving a balance of 12 bushes still growing on three properties.

Thousands of plants of Berberis fendleri have been located in the mountain section of southwestern Colorado, where that species grows wild. Cluster cups have been found in abundance on these bushes, but the strain does not carry over to the wheat in that district.

With the completion of the August survey we have rechecked all of the findings of common barberry in this State, with the exception of those in the city of Denver and a few isolated towns, which will be rechecked during the month of September. Up to date we have found that 15 per cent of the bushes removed have produced sprouts.

Most of the grain of Colorado has been harvested, and we are pleased to report only a small loss from black stem rust.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report).

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (No report).

SOUTH DAKOTA

College of Agriculture, Brookings, (Barberry Eradication, Lynn D. Hutton) (No report).

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report).

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayoue) (No report.

Northern Great Plains Field Station, Mandan (J. C. Grinsmade, Jr.) (No report).

Dickinson Substation, Dickinson (Ralph T. Smith)(Sept.12) The hot weather of August continued until September 5, when the temperature dropped suddenly and it has been quite cool ever since. The drought also continued unbroken except by light rains until today. It has rained at frequent intervals today and promises more before clearing up. The hottest day of the year was September 4, when the temperature reached 96 degrees. The lowest point this month was several degrees above freezing and the corn crop still remains uninjured by frost.

The work of threshing was interrupted by the County Fair, by fall seeding and silage operations. All varietal plats are threshed, however, and part of the increase plats. Duplicate plats of seven winter rye varieties have been sown in stubble. Duplicate plats of eight winter wheat varieties have been sown in stubble and also in standing corn.

The Substation prepared for the County Fair an educational exhibit, consisting of sheaf samples of the leading varieties of grain and forage crops, threshed grain of leading cereal varieties, and ear exhibits of various corn varieties. These exhibits received considerable attention and many questions were asked regarding the different varieties. Mr. J. Q. Adams, of Minneapolis, was in charge of an exhibit showing the different commercial grades of wheat and methods of determining them. Geo. C. Mayoue and some of his coworkers presented an instructive barberry eradication exhibit, containing a large barberry bush found in Grant County. The Agronomy Department at Fargo had an exhibit showing macaroni from different varieties of durum wheat, also the wheat and semolina from which the macaroni was made. There was an interesting collection of grasses prepared by the Northern Great Plains Field Station at Mandan. All of these exhibits received their share of attention. Dr. H. L. Walster, agronomist at the State Experiment Station judged the farmers' exhibits of farm crops.

The yields obtained from the replicated plats of oats and barley at the Substation are given below.

These yields are the best obtained since 1915. The early varieties yielded relatively more than usual due to dry weather in July which hastened the maturity of midseason and later varieties.

Yields of oat varieties grown at the Dickinson Substation, in 1922, in quadruplicate 1/56-acre plats.

C.I. No.	Variety	Yield (Bu.per Acre)	C.I. No.	Variety	Yield (Bu.per acre)
73	Lincoln	90.0	754-2	Early Mt.No.8	[illegible]
659	Silvermine	[illegible].7	787	Richland	[illegible].1
165	Sixty-Day	[illegible].7	656	Early Mt. No.2	[illegible].[illegible]
441	Nebraska No.21	[illegible].4	493	Golden Rain	[illegible].3
194	Sweedish Select	88.6		Banner Selection from	
741	Siberian	88.1		British Columbia	70.7 a
459	Kherson	87.4	1c0-10	Banner Sel.No.10	[illegible].0 b
160	Banner	[illegible].1	551	White Russian	[illegible].[illegible]
65[illegible]	Big Four	[illegible].9	656-1	Early Selection of	
500	Victory	[illegible].7		Early Mt. No.2	[illegible].[illegible] b
447	Iowar	[illegible].3	1926	Yaroslav Banner	62.6 c

a Two plats. b One plat. c Using 32 lbs, per bushel the same as oats.

Yields of barley varieties grown at the Dickinson Substation, in 1932, in quadruplicate 1/50-acre plats.

C.I.No.	Variety	Av.Yield (Bu.per acre)	C.I.No.	Variety	Av.Yield (Bu.per acre)
	White Smyrna Sel. S.Dak.28-1--15	57.7 a	-	Beil Hanna No.1	49.3
	White Smyrna Sel. S. Dak.28-7-15	57.5	863	Manchuria	49.3
650	White Smyrna	56.8	1177	Horsford(Wing's Selection)Hooded	
-	Scholey	55.7		Hulled	48.3
203	Hanna	51.9	532	Mariout	47.4
531	Hannchen	51.5	1311	Flynn(Smooth Awned)	45.5
-	Princess	50.0	182	Odessa	44.9
575-1	White Gatami	50.0	187	Swan Neck	43.9
907	Stelgum	49.6	575	Black Gatami	36.7
			663	Chile	38.3
			262	Nepal	53.9 c

a Two plats. c. Using 48 pounds per bushel as with other varieties.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (No report).

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report)

WESTERN BASIN AND COAST AREAS(North to West and South).

IDAHO

Aberdeen Substation, Aberdeen (J. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (S. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones)

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (W. W. Mackie)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
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Vol. 14 September 30, 1922 No. 23
Personnel (Sept. 21-30) and Project Issue.

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PERSONNEL ITEMS

Walter W. Ashbaugh and Carl J. Ostrom, who have been employed as field assistants in barberry eradication in Illinois since July 1, 1922, have resigned effective September 15 to return to college.

Dr. Carleton R.Ball, cerealist in charge, returned to Washington September 23 from a tour of inspection of agronomic and pathologic experiments conducted cooperatively in Iowa, Indiana, Illinois, Wisconsin, and Minnesota. He reports that very gratifying progress has been made in the research on corn rots and metallic diseases, on the leaf rusts and crown rust, on the epidemiology of stem rust, especially with reference to air transmission of spores, and on chemical eradication of the barberry bush. The vigor of many of the escaped bushes and continued production of sprouts from them after eradication makes the problem of chemical eradication exceedingly important. Apparently the application of certain substances to large bushes last october resulted in death of the plant and of the root system, so that no growth appeared from the bushes and no sprouts have developed from the roots. These experiments are being considerably amplified this fall and abundant data should be in hand by the middle of next summer.

One of the interesting events was a barberry eradication bee held near Red Wing, Minn., on the afternoon of September 20, during which a total of more than 1,000 bushes was taken out, more than half of them being bushes older than seedlings. Both farmers and townspeople took part in the eradication and both were well represented at the luncheon which followed, served by the Commercial Club of Red Wing.

Albert N. Brooks, Bernard S. Meyer, and Harmon A. Runnels, all engaged in barberry eradication in Ohio during the summer months, completed their duties and resigned from the service about September 15.

Henry M. Burlage and Ross L. McCally, who were appointed on July 1, 1922, as field assistants in barberry eradication in Indiana, resigned from the service early in September in order to begin duties as instructors at Purdue University.

Lyle A. Churchill, of Sumner, Iowa, was appointed September 6, 1922, to assist in the campaign for the eradication of the common barberry, with headquarters at St. Paul, Minn.

Harry L. Dixon and Harry C. Neville, who have been employed during the summer in barberry eradication in Illinois, resigned from the service about September 15 in order to resume studies at the University of Illinois.

John R. Fitzsimmons, State leader of the barberry eradication campaign in Colorado, with headquarters at Fort Collins, resigned September 25 and is resuming the study of landscape architecture at Harvard University. Mr. Fitzsimmons spent several days in Washington in the preparation of the data collected during the past summer.

Anton E. Flaner, field assistant in barberry eradication with headquarters at Agricultural College, N. Dak., tendered his resignation effective September 15 in order to resume studies at the University of Wisconsin.

Emil F. Guba, who has been engaged in the summer barberry eradication campaign in Illinois, completed his duties September 15 and is resuming graducate studies at the University of Illinois. Mr. Guba was reappointed collaborator with the Office of Plant Disease Survey, of the Bureau of Plant Industry, effective September 16.

Dr. G. N. Hoffer, pathologist in charge of the investigation of root, stalk, and ear rots of corn, in cooperation with the Purdue University Agricultural Experiment Station, La Fayette, Ind., left September 17 for New Haven, Conn., where he visited Dr. D. F. Jones, geneticist at the Connecticut Agricultural Experiment Station, in company with Dr. H. B. Humphrey, pathologist in charge of cereal disease investigations, and inspected the corn-breeding experiments at Mt. Carmel, Conn. On September 20 and 21 Doctor Hoffer and Doctor Humphrey conferred with Dr. R. H. True, of the University of Pennsylvania on certain physiological experiments. On the following day they visited the Delaware Agricultural Experiment Station, Newark, and had a conference with Dr. T. P. Manns concerning corn-disease investigations, returning to Washington that evening. While here Doctor Hoffer studied the corn-breeding experiments conducted by F. D. Richey and C. H. Kyle at Arlington Experiment Farm and discussed the results of the corn-disease investigations that are being conducted in Indiana. Doctor Hoffer left for La Fayette September 26.

Edwin E. Honey, who has been engaged as field assistant in barberry eradication in Illinois since July 1, 1922, resigned September 12 in order to resume teaching at Cornell University.

Clarence L. Jensen, of Aberon, N. Dak., was appointed field assistant in barberry eradication, effective September 6, 1922, with headquarters at Agricultural College, N. Dak.

Dr. F. E. Kempton, pathologist in charge of barberry eradication, returned to Washington September 27 after a six weeks' tour of inspection of the progress of barberry eradication in the States of Ohio, Indiana, Michigan, Wisconsin, Minnesota, North and South Dakota, Nebraska, Iowa, and Illinois.

He reports that the original farm-to-farm survey is progressing as rapidly as planned. In practically all cases bushes are being eradicated as soon as found, as property owners generally cooperate readily in their removal.

Farm bureaus, bankers' associations and college, university, and experiment station authorities are giving special cooperation and aid. Newspapers are aiding in educating property owners by giving space to our articles and preparing special articles and editorials. The Conference for the Prevention of Grain Rust, which is cooperating with the Bureau of Plant Industry in this campaign, has prepared and distributed a large amount of publicity and has aroused much interest.

On a number of areas where escaped bushes had been removed, numerous sprouts and seedlings were found, indicating that very careful inspection must be made of these areas for a number of years. The number of sprouts appearing not only in areas of escaped bushes but from cultivated hedges and single bushes removed make necessary more thorough resurveys and very careful removal of all sprouts.

Experiments in chemical methods of eradication conducted near Toledo, Ohio, Gurnee, Ill., and Marshall and Black Earth, Wis., were visited. These show positive results for some of the chemicals used. Larger experimental areas will be treated this autumn.

On September 27, at the request of the county agent, J. Ross Lintner, R. W. Leukel, assistant pathologist, spoke at a meeting of farmers and millers at Luesburg, Va., on the subject, "Prevention of Bunt and Nematode Disease in Wheat." Millers in that region have had considerable trouble with wheat of inferior quality due to these two diseases, and a campaign of disease prevention through seed treatment is being launched.

James K. Kent and Paul R. Miller, who have been employed as field assistants in barberry eradication in Iowa, since July 1, 1922, tendered their resignations, effective September 15, and have returned to college.

Ernest A. Lungren, field assistant in barberry eradication in Colorado since July 1, 1922, resigned September 23 in order to resume studies at the Colorado Agricultural College.

George W. Martin, who has been engaged during the summer as field assistant in barberry eradication in Illinois, resigned September 12 and resumed his duties as professor of biology at Monmouth College. He has been reappointed collaborator with the Office of Plant Disease Survey, effective September 13.

Andrew J. Moyer, employed as field assistant in barberry eradication in Illinois, since July 1, 1922, resigned his position September 16 and has taken up graduate study at the University of Wisconsin.

Galen C. Ogerkirk, of Kent, Minn., has been appointed field assistant in barberry eradication with headquarters at Agricultural College, N. Dak., effective September 12, 1922.

Paul T. Sanders, engaged in barberry eradication in Illinois during the past summer, resigned September 15 and resumed graduate studies at the University of Chicago.

Miss Tryphosa E. Small, clerical assistant to the State leader of the barberry eradication campaign, with headquarters at Urbana, Ill., and who has been on leave without pay during the past several months, has resigned her position because of continued ill health.

William S. Speed, field assistant in barberry eradication in Ohio, since July 1, 1922, has tendered his resignation, effective September 18, in order to return to college studies.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, will leave September 30 for Granite City, Ill., to discuss with Prof. G. H. Dungan plans for the continuation of the cooperative experiments for the control of flag smut of wheat. He will then proceed to St. Louis, Mo., to inspect the laboratory experiments with flag smut recently begun by Miss Marion A. Griffiths at the Missouri Botanical Garden. At Urbana, Ill., Doctor Tisdale and Professor Dungan will begin the preparation of a State publication covering the results so far obtained in the cooperative experiments for the control of flag smut. Doctor Tisdale will return to Washington about October 10.

Ferdinand S. Wolpert, who was employed April 1 to assist in the supervision of the cooperative experiments for the control of flag smut at Granite City, Ill., completed his duties September 30, when his appointment was terminated.

Dr. A. G. Johnson, pathologist in charge of the investigation of imperfect and sac fungi, returned to Washington September 30 after a three weeks' trip in the North Central States. He inspected the cooperative investigations with corn diseases in Illinois and Indiana, and the flax investigations conducted in cooperation with the North Dakota Agricultural Experiment Station. He also conferred with experiment station officials at Brookings, S. Dak., and with the State leader of barberry eradication. At Ames, Ia., he inspected the corn breeding experiments and corn-disease investigations, conferring with subproject leaders and experiment station officials.

VISITORS

L. W. Arny, representing N. W. Ayer & Son, a Philadelphia advertising agency, called at the Office September 30 to consult specialists about the feasibility of increasing the acreage of flax and wheat in combination.

William Sewall, of Njoro, Kenya Colony, British East Africa, on September 30 conferred with specialists of the Office concerning the culture of wheat and corn.

MANUSCRIPTS AND PUBLICATIONS

A manuscript entitled "A method of treating maize seed to destroy adherent spores of downy mildew," by Dr. W. H. Weston, Jr., was submitted September 30 for publication in the Journal of Agricultural Research. This is fourth in the series of articles prepared by Doctor Weston in connection with his investigations of downy mildews of maize in the Philippine Islands.

Request has been made for a reprint of Farmers' Bulletin 1176, entitled "Control of the Root, Stalk, and Ear Rot Diseases of Corn," by James R. Holbert and George N. Hoffer.

An article entitled "Some Graminicolous Species of Helminthosporium," by Dr. Charles Drechsler, assistant pathologist, has been approved for publication in the Journal of Agricultural Research.

An article entitled "Straw," prepared by Dr. C. E. Leighty, was recently approved for publication in the Young Folks' Cyclopedia of Agriculture.

Galley proof of Department Bulletin 1127, entitled "Some New Varieties of Rice," by Charles E. Chambliss and J. Mitchell Jenkins, was read September 30.

Page proof of a paper entitled "Determination of Biologic Forms of Puccinia graminis on Triticum spp.," by M. N. Levine and Dr. E. C. Stakman, was read September 21. This will be published as Minnesota Agricultural Experiment Station Technical Bulletin No. 8.

C E R E A L C O U R I E R

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Bureau of Plant Industry, U. S. Dept. of Agriculture.
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Vol. 1- October 10, 1922 No. 24
Personnel (Oct. 1-10) and Field Station (Sept. 16-30) Issues.

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PERSONNEL ITEMS

Olaf S. Aamodt, assistant pathologist, with headquarters at University Farm, St. Paul, Minn., has been granted permission to carry post-graduate study at Cornell University, Ithaca, N. Y., on the subjects of plant pathology and genetics. He has been granted leave of absence for this purpose from October 1, 1922, to January 31, 1923.

Fred A. MacKenzie was appointed field assistant in barberry eradication, with headquarters at Ames, Ia., effective September 20, 1922.

Mrs. Pauline I. Pedley, clerical assistant in the cereal-disease investigations conducted in cooperation with the California Agricultural Experiment Station, Berkeley, Calif., resigned September 14 and is leaving Berkeley.

Charles G. Scearce was appointed September 16 as field assistant in barberry eradication, with headquarters at La Fayette, Ind.

Dr. E. C. Stakman, pathologist, who has been studying the barberry situation in Europe for the last four months, expects to sail from Southampton October 11 on the "Homeric" of the White Star Line and probably will be in Washington October 18.

Hugo Stoneberg, assistant in corn investigations, left Washington Sunday October 8, for Florence and other points in South Carolina and adjacent States for the purpose of taking notes on and harvesting seed corn grown in cooperation with agricultural experiment stations and with farmers. He will return about Oct. 18

Winfield S. Darnell was given an appointment, effective September 20, to assist in barberry eradication, with headquarters at Fargo, N. Dak.

Steve J. Timcorious was appointed field assistant, effective September 20, to assist in barberry eradication, with headquarters at Ames, Ia.

The following field assistants employed in barberry eradication during the past summer in the States named below have completed their duties and tendered their resignations.

Illinois: Siegfried P. Harter.

Indiana: Albert W. Heine, Ray T. Kelsey, Reuben C. Marshall, Glenn H. McKenzie, William W. Rudenaur, Harold J. Vegel.

Iowa: Ralph W. Adamson, John A. Trumbower, Marion E. Yount, Edward M. Zeman.

Michigan: Clato R. Coe, Joseph A. Eckel, Kenneth R. Kerr, Ben W. Lafene, Herbis L. Lewis, Sigurd T. Mathieson, Arthur C. McIntyre, Charles T. McIntyre, George W. Olson, Howard E. Parsons, Carl H. Ripatte, Earl A. Sindecuse, Forrest C. Strong, Paul E. Tilford.

Minnesota: Charles Auburg, Roland C. Bevan, Karl F. Brunkow, Frank A. Douglass, William M. Emerson, Edward C. Grumke, Henry W. Hecker, Henry C. Hurlburt, Everett R. Johnson, Robert H. Knight, Paul W. Kunkel, Gerald Mason, Lloyd I. Nelson, George M. Peterson, David W. Purdy, Vard M. Shepard, Jerry A. Vacha.

Nebraska: Benjamin F. Dittus, Jacob Friedli, Gomer V. Jones, David E. Lindstrom, Ralph D. McDermott, John L. Moore, Julian W. Riddick, Loyal L. Rulla, Rayburn W. Samson, Willard J. Simpson, Walter O. Weaver, Robert E. Weir

North Dakota: Harper J. Brush, Daniel J. Denis, Herbert W. Nicholson Ralph W. Irick, George C. Kadlec, Franklin W. Roberts, Albert S. Severson, John C. Stewart.

Ohio: Raymond A. Dobbins, Ralph H. Hagelberger, Howard W. Johnson, Curtis May, Earl M. Prather.

South Dakota: Frank Coffey, Guy A. Larson, John W. Moore, Joe F. Murray Frank F. Welch.

Wisconsin: George S. Bryan, Everette L. Campbell, Kenneth H. Corbett, Carl W. Damsheuser, George K. Davis, Allan D. Dickson, Samuel S. Feldman, George A. Fiedler, Oscar H. Gerhardt, Leslie A. Hill, Earle F. Holt, George W. Longenecker, Frank D. McKay, Eugene J. Rankin, Marvin A. Schaars, Henry Stevens, Clarence W. Weber, Alfred M. Wolfson.

Mrs. Ralph W. Brown, formerly Miss T. Enid Ang, a member of the clerical staff of the Office from September, 1918, to May, 1920, visited the Office October 3. Her home is now in Cincinnati, Ohio, where her husband, formerly a grain supervisor in the Bureau of Markets, is in the grain business.

Mrs. W. O. Gordon, née Lillian Fissel, renewed old acquaintances in the Office October 9. She was formerly stenographer in western wheat investigations, resigning in 1916 upon her marriage to Mr. Gordon, then connected with the Bureau of Chemistry, but now in charge of the chemical laboratory of the Evans Milling Co. of Indianapolis, Ind.

Dr. Takewo Hemmi, plant pathologist, Phytopathological Institute, Kyoto, Imperial University, Kyoto, Japan, conferred with members of the Office staff October 10. Doctor Hemmi was a post-graduate student at the University of Wisconsin from October, 1921, until early this summer, and has visited other institutions, including libraries, in the eastern United States. He expects to spend about ten days in Washington, D. C., before proceeding to Europe to visit various centers of phytopathological research. Before coming to this country Doctor Hemmi was associated with Dr. Kingo Miyabe, Professor of Botany and Director of Botanic Garden, Hokkaido, Imperial University, Sapporo, Japan. He has published extensively on the anthracnose diseases of plants.

R. C. Nichols, formerly of Bluefields, Nicaragua, was an Office visitor October 6. He is desirous of obtaining information regarding the possibility of growing wheat in Nicaragua.

MANUSCRIPTS AND PUBLICATIONS

Engraver's proofs of illustrations for Department Bulletin 1127, entitled "Some New Varieties of Rice," by Charles E. Chambliss and J. Mitchell Jenkins, were approved October 3.

Galley proof of Farmers' Bulletin 1301, entitled "The Common White Wheats," by J. Allen Clark, J. H. Martin, and C. R. Leighty, was read October 4.

Page proof of Department Bulletin 1120, entitled "Heat Canker of Flax," by C. S. Reddy and W. E. Brentzel, was read October 6.

Yearbook Separate No. 872, entitled "The Corn Crop," by C. R. Leighty and C. W. Warburton, agronomists, Bureau of Plant Industry, and O. C. Stine and O. E. Baker, agricultural economists, Bureau of Agricultural Economics, was received from the Government Printing Office October 3.

Minnesota Agricultural Experiment Station Technical Bulletin 8, entitled "The Determination of Biologic Forms of Puccinia graminis on Triticum spp.," by E. C. Stakman and M. N. Levine, was received October 9.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hamerly) (No report)

VIRGINIA

Arlington Farm, Rosslyn (Cereal Project, J. W. Taylor) (Sept. 20)

Fall seeding of the grain crops began Sept. 15, when the first wheat was seeded in the rate and date of seeding experiment and the seed-bed preparation experiment. Owing to the recent heavy rains the plowed land worked into excellent condition under the method of preparation which has been in effect the past four years. The disced plats were unusually infested with crab-grass, but nevertheless a fair seed bed was fitted with the customary three discings. The results of this experiment for the present year agreed in general with those of the preceding two years, showing a gain for discing over plowing on land with a summer cultivated crop with a considerably less expenditure of labor. Seeding on Sept. 15 caused a loss of three bushels or more over that sown Oct. 5 or Oct. 25.

Buckwheat was practically a failure this year. Very little branching occurred in the plants, and weeds were numerous throughout the plats.

(Corn, H. S. Garrison) (Oct. 8)

The taking of notes on the standing corn is practically completed and the harvesting is well under way. Mr. Richey and Mr. Willier have finished harvesting their plats and Mr. Hartley is harvesting the varietal test. The types of Selection 119 on the upland have been cut and shocked. During the past week photographs were taken of various inbred strains and families.

In order to classify the various forms of chlorophyll defects Mr. Garrison has taken herbarium specimens of all the different kinds of leaf spottings available. These will be used in connection with the inheritance studies of the different spots and their effect on yield.

(Oats, T. R. Stanton) (Oct. 9)

Sowing of the winter-oat nursery at the Arlington Farm was completed October 27. Of the 71 varieties and selections grown in the duplicate 5-row block nursery of last season, 65 were again sown in a similar nursery, with the addition of about 25 new selections that were advanced from the 1922 single 16-foot row nursery. The latter nursery for 1923 includes for the greater part the most promising strains of the relatively large population of F_2 progenies from crosses between Fulghum and various strains of Culberson, Fulghum, and Hutcheson, etc., that were growing 5-foot plant rows last year. It is hoped that some definite observations may be made during the coming winter on the relative cold-resistance of these hybrid strains. A 5-foot plant-row nursery consisting of about 300 rows also was sown. This includes various miscellaneous plant material from standard varieties, hybrids, false-wild oats, etc.

On October 6, about 60 hybrid seeds of crosses between various spring varieties of oats, made by G. A. Wiebe at the [illegible] Station this past season, were sown in the greenhouse at Arlington Farm. The F_1 plants should mature in sufficient time to sow the seed they produce at Aberdeen next spring.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (No report).

MID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report).

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (Oct. 2). The latter half of September was generally favorable for maturing crops and for farm work. The corn crop at present is in good condition over most of the State, the poorest corn being along the Mississippi River from St. Louis southward, and in the southwestern corner of the State. Plowing and preparing the ground for winter wheat made satisfactory progress during the last two weeks, and in the western border counties almost half of the grain has already been sown.

The yields of wheat varieties in rod-row plats on the Station field were as follows:

Variety	Bu. per acre.	Variety	Bu. per acre.
Fulcaster	33.48	Cornell Selection 123-32	25.08
Harvest Queen	29.04	Portage	28.32
Mich. Wonder	29.28	Red Rock	31.80
Mich. Wonder No.21	31.08	Gladden	30.48
Mich. Wonder No.54	33.36	Trumbull	30.60
Mich. Wonder No.96	33.00	Blackhull	36.12
Mich. Wonder No.209	36.12	Zimmerman	29.04
Nigger	22.92	Minhardi	19.32
Farmers Friend	31.32	Minturki	25.68
Illini Chief	32.88	Harvest Queen (Kans)	31.32
Jones Climax	28.44		
Kanred	16.68		
Kessinger	31.08		

An outstanding feature of the test was the extremely good showing made by Blackhull in spite of the fact that the other hard wheats included yielded poorly. The quality of the grain produced by Blackhull also was markedly superior to that produced by other hard wheat varieties. The Blackhull was almost free from yellow berry, while all other hard wheat grown contained a considerable percentage of yellow berry. The probable error of the mean yields given above, as determined from the Fulcaster check plats, was 5.04 per cent.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (Oct. 3) I began harvesting the corn experimental plats last week and have just finished today the gathering of the ears from the selfed lines and crosses. Work on the comparison plats will begin tomorrow with the preliminary counting of plants, etc. The weather thus far has been ideal for harvesting, though September has left us with a decided deficiency in rainfall, and fall seeding is being delayed

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (Sept. 2t) The harvesting of the hand-pollinated ears in the earlier varieties of corn was started September 11 and is continuing with the later varieties as they ripen. At the present time about half of the 7,000 pollinations have been gathered. The new method of pollinating has proved very successful and the ears are exceptionally well filled, many being covered clear to the tip.

With the exception of a few cold nights the first of last week, we have had good weather for ripening corn and every indication is that Iowa will have a " bumper" corn crop.

Dr. C. R. Ball visited the station from September 14 to 17 and during this time he looked over the corn work.

Iowa State College, Ames (Barberry Eradication, J. H. Muncie) (No report).

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report).

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (September report) During the month of September 828 bushes of common barberry were located. Of this number 412 bushes were found in Cook County. Eradication in this County is difficult because of the density of population, and the necessity for conducting the campaign on foot makes progress slow. About the middle of September most of the field men resigned in order to enter college or accept teaching positions.

Doctors Ball, Humphrey, Johnson, and Kempton, from Washington, D. C., and Mr. D. G. Fletcher of Minneapolis, Minn., reviewed the progress in barberry eradication about the middle of September. Doctor Kempton, Mr. Fletcher, Noel F. Thompson, W. A. Walker, and J. H. Muncie visited some farms in northwestern Illinois on which escaped barberry areas were found early in September.

Considerable trouble is always experienced in getting people to report the removal of common barberry bushes. Some individuals persistently ignore letters of inquiry on this subject. This month a number of letters were sent out to several old delinquents by registered mail. This certainly produced results, as nearly everyone replied stating that the barberry bushes had been removed or that plans were being made to do so immediately.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report).

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

Botany Department, Purdue University Agricultural Experiment Station, La Fayette (Barberry Eradication, K. E. Beeson) (September report) Most of the field assistants completed their duties some time in September in order to return to school or to permanent positions. At the close of the month three teams were still in the field, one operating in areas of escaped barberries in Henry County, the other two surveying Tippecanoe and Rush Counties. They are finding plantings almost daily, but infection is lacking generally on the bushes in northwestern Indiana. However, in southern Indiana some heavy rust epidemics still are being found which can be traced directly to barberry. In September, 2,135 bushes were removed from 30 plantings.

Demonstrations at fairs in counties that are to be surveyed this fall and next summer, have been of an educational nature. By means of these demonstrations numerous barberry leadswere received, and information was readily obtained from farmers in regard to the presence of rust in certain counties. The demonstration usually included both Japanese and common barberry, rusted straw, shriveled grain, and appropriate posters. The State fair display, in addition to the material used for county fairs, included four transparencies showing the life cycle of the rust. A mechanical flasher produced intermittent light for these and served as a means to attract attention to the display. It was evident that the State publicity campaign has been successful this year, as the general reaction on the part of farmers was one of curiosity to see the bush that was responsible for the spread of the rust. It was necessary to convince only a small minority of the relation between the bush and the rust.

The original farm-to-farm survey was completed in two counties and is under way in two more. Resurvey and eradication of all bushes from areas of escapes are in progress in a number of counties and will be conducted after weather conditions become unfavorable for farm-to-farm surveys.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report).

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, Leo J. Federer) (No report).

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, H. D. Barker for E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report).

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John H. Stieglinger) (Sept. 18) The first ten days in September were hot and very dry. It rained on the 9th, 10th, and 11th and the weather has been cooler since. Wheat sowing is in full swing, as farmers are taking advantage of the moisture to get wheat started.

The sorghums are ripening rapidly and from now on harvesting will be in order. It is expected that yields will run about average, which will be rather unusual, as our average is the result of a number of both good and poor yields.

The Woodward County Free Fair was held September 14, 15, and 16. The exhibits showed that crops were not extra good. A small number of sorghum and broom corn varieties were taken from the Station as a kind of educational exhibit of the different varieties and their response under our conditions. With the assistance of the Woodward Chamber of Commerce a picnic dinner was served Sept. 16 at the Station for farmers attending the fair. Speakers for the occasion were Carl Williams, editor of the Oklahoma Farmer-Stockman, and Mr. George Bishop, associate editor of the Oklahoma Farmer, besides some local talent. There were from two to three hundred persons in attendance. Messers. Williams and Bishop were shown over the station and appeared much interested in the work, especially in the date-of-seeding work with milo and kafir.

Precipitation for September to date, 2.70 inches. Maximum temp. 103.5 degrees, Sept. 9; minimum 49 degrees, Sept. 11.

(Sept. 30) Sorghums and broomcorn have continued to ripen rapidly and are being harvested as they become ripe. The main part of the sorghum varietal experiments are harvested, also most of the date-of-seeding plats and the kafir rate-of-seeding experiments. All of the broomcorn, with the exception of the last date plat, has been harvested.

Messrs. Osborn and King, of Lawton, Okla., arrived at the Station on the 24th and left on the 26th. The writer accompanied them to Hobart, Okla., via Canadian and Wheeler, Texas, and Elk City, Okla. From Hobart, Okla., he returned by train to Woodward, via Mangum, Okla., on the 28th. Observations on the trip showed that crops are very spotted. Good crops occurred from Wheeler, Texas, to Elk City and Hobart, Okla. Outside of that strip crops are very short. From Hobart to Mangum cotton is short and the sorghums badly burnt. It appears as if most of the cotton in the district visited will be picked within a month.

In districts where there has been rain wheat is sown and coming up; in other districts it has been too dry to prepare much land for wheat.

Maximum temp. for last half of Sept., 90° on the 24th; minimum 47° on the 20th. Precipitation for last half of month, 0.07 inch; total for Sept. 2.77 inches.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report).

Hays Branch Experiment Station, Hays (B. B. Bayles for A. F. Swanson) (Oct. 2). Only a trace of moisture fell during the last two weeks of September. There has been no rain of value to crops since July 9.

Wheat seeding on the Cereal project was finished September 30 except in the date-of-seeding test. The seed bed was in poor condition and so dry that none of the wheat will germinate until it gets a rain. Wheat seeded Sept. 1 in the date-of-seeding plat has not germinated yet. Most of the farmers in this section of the State have finished seeding, but very little of the wheat will germinate until it gets a rain.

Threshing on the sorghum varietal plats will begin tomorrow. Practically all of the sorghum varieties were cut the last of August and the first week in September. Drying weather since then has put them in very good condition for threshing.

A. F. Swanson writes from the University of Minnesota that he has enrolled and is busy getting his graduate work lined out.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (Sept. 1-16) The first half of September has been very hot and dry in this section. Practically no moisture has been recorded during the half month just past, and as a result the soil is very dry. Early sown winter wheat is again in danger of drying out as it did last fall. Most of the wheat has been sown in this section but little of it will be up before rain in received. Corn and row crops have ripened very rapidly. With continued dry weather corn will be dry enough to crib within 30 days. Native pastures have dried up, and the foliage has begun to drop from the trees. While as yet we have had no frost, there have been a few cool nights and frost can be expected almost any night from now on.

Work on the Farm is fully as far progressed as is the season. Most of the corn and sorghum has been cut and harvesting of these crops probably will be completed within the next week. Some of the early-maturing selections of Dawn kafir were harvested the first of the past week. The unselected Dawn very likely will not be fully mature for another week or ten days. Excellent crops of sorghum and corn are being harvested on the Farm this year. A considerable amount of the corn is being put in the silo. The quality of this silage from the standpoint of grain percentage is much better than the average.

The regular replicated plat emperiment of winter wheat was sown September 16. A total of 60 plats are included in this test. The third set of plats in the rate-and-date experiment was sown September 16. The wheat sown August 16, and September 1, in this experiment, has begun to emerge on the fallow. The corn ground is extremely dry and dusty and none of the wheat sown on corn ground will emerge before rain is received.

The seeding of the nursery started September 12. With favorable weather conditions the nursery and plats seedings of the Office probably will be completed this next week; with the exception of the October seedings of the date experiments. A total of some 200 plats and possibly 2,100 nursery rows of winter wheat will be sown this season.

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren for John R. Fitzsimmons) (No report).

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report).

WYOMING

Chugwater Experiment Farm, Archer (A. L. Nelson) (September report) As there were practically no cereal crops this year there is little to report concerning harvest. Methods of seeding winter wheat is the only experiment harvested. This experiment has not yet been threshed. The spring nursery has been harvested and stored ready for threshing. The yields will be very light. The winter wheat nursery has been seeded and produced a good stand. Counting of plants will begin as soon as threshing is over. The usual seeding of winter wheat in fortieth acre plats was accomplished Sept. 9, as was also the various methods of seeding this crop. All seedings on fallow emerged with good stands. The stand and vigor of plants is much better where seeded by disk-furrow drill. The summer fallow soil plowed during the early summer has produced a better and more vigorous stand of winter wheat than the spring-plowed fallow. These experiments are being watched very closely.

During the summer a close study has been carried out with sunflower selection and variation in head rows. The results are very gratifying.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cooley) (No report).

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (No report).

Belle Fourche Experiment Farm, Newell. O. R. Mathews, Newell, S. Dak., in a letter dated Oct. 4, 1922, reports the following yields of wheat and flax.

YIELD OF WHEAT VARIETIES (IRRIGATED)

Variety	C.I. No.	Yield per Acre -Bushels Replication 1	2	3	Average	Weight per bushel.
Kubanka	1440	16.7	19.2	21.7	19.2	54
Acme	5284	15.0	15.0	17.1	15.7	54
Power's Fife	5097	13.3	14.2	16.3	14.6	56
Disco	1486	12.9	12.9	12.1	12.6	55
Disco	1266	15.8	14.2	15.0	15.0	57
Marquis	5041	17.5	16.7	16.3	16.8	56
Kota	5248	18.3	20.0	20.8	19.7	57
Hard Federation	4733	11.3	8.8	10.4	10.2	43
Federation [illegible]3	4734	10.4	12.5	10.8	11.2	44
Hayne's Bluestem	2873	15.0			15.0	51

YIELD OF WHEAT VARIETIES - (DRY LAND)

Variety	C.I.No.	Yield per Acre-Bushels Replication 1	2	3	Average	Weight per bu.
Kubanka	1440	26.8	26.3	28.7	27.9	56
Marquis	3641	24.2	25.0	22.5	23.9	57
Kota	6246	27.5	26.3	24.6	26.1	56

YIELD OF FLAX VARIETIES (IRRIGATED)
(Plats of 1/50 acre in triplicate)

N. D. R. No. 52	8	17.0	14.3	12.1	14.5	51
N. D. R. No. 114	13	13.4	11.6	13.8	12.9	53
Primost	12	12.5	13.8	11.2	12.5	53
Damont	3	12.5	10.7	12.5	11.9	52

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayoue) (No report).

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (Oct. 2). The Uniform-Winter-Hardiness wheat nursery was sown Sept. 9, and emerged with good stands about Sept. 16. Stand counts were made Sept. 20.

Bulked hybrid progenies of winter wheat received from Moccasin, Mont., were sown in 8-rod rows and emerged about Sept 26 with good stands.

Hybrid progenies of winter wheat from Manhattan, Kans., were sown Sept. 26 and 27. These probably will not come up with good stands before we have more rain.

Threshing and cleaning of all cereal and flax plats and flax nursery rows is completed. Flax selections and hybrids made this season still remain to be threshed. Stand counts in winter wheat are still to be made, flax in the moisture-requirement experiment is not yet harvested and there remain in the field a few flax nursery-rows that have not ripened satisfactorily and probably will not.

Earnest Mortensen, a junior student at the N. D. Agricultural College Fargo, N. Dak., was employed Sept. 9 - 22 to assist with the Cereal Investigations work filling the position left vacant by the early resignation of R. L. Harrison.

A pageant representing episodes in North Dakota history from the days when the Indian ruled alone, the Lewis and Clark expedition, and the great War to the present time, was presented by the people of the towns of Mandan and Bismarck. The occasion celebrated the opening of the new Liberty memorial bridge across the Missouri river. The performances were remarkably successful and drew larger crowds, according to reports, than ever assembled here on any previous occasion.

Work has already begun on a dam across the Heart River, just west of the bridge on the way to town from the Station. This will raise the river to form a good sized lake directly adjoining the Station grounds, providing facilities for swimming, boating, and winter sports.

Messrs. R. A. Oakley and H. L. Westover, of the Office of Forage-Crop Investigations, visited the Station Sept. 29.

During the first half of September the rainfall was abundant and frequent. The total precipitation for the month was 2.31 in., all being recorded the first half of the month.

Maximum temperature for the first half of September was 98° on Sept. 4: minimum, 37° Sept. 9 and 14.

For the last half of September the maximum temperature was 92° on Sept. 26, and the minimum 33° Sept. 19.

A storm with high wind and rain and some hail did considerable damage to late crops especially to flax still standing in the field. The portable house used in the harvesting of the flax nursery was blown over a complete revolution and half again, and left upside down.

Dickinson Substation, Dickinson (Ralph W. Smith) (Sept. 30) The warm weather of late summer continued during most of September. There has been no killing frost so far except in a few local areas. Corn has matured unusually well and the yield is generally good.

E. B. Brown was here last week, remaining till Sept. 25, when he left for the Akron Substation, Akron, Colo. Mr. Brown supervised the husking of the corn varieties after taking notes on the varieties, and gave very material help in the husking and weighing of the different varieties. Samples of each variety were weighed and hung up to dry to determine the moisture lost before being reduced to an air-dried condition. Computed at 70 pounds per bushel of ears in the present condition, which was comparatively dry, most of the varieties yielded not far from 30 bushels per acre. Ivory King flour corn gave the highest yield, one replication making approximately 65 bushels per acre. Gehu Flint gave good yields, also Paynes White Dent and Northwestern Dent. As a result of the good corn crop in this section, the corn acreage will doubtless be increased next year.

Thrashing at the Substation is finished except the nursery.

Winter wheat sown in standing corn has a good stand. Winter [illegible] and rye sown in stubble has not so good a stand because of the dry condition of the soil The stand in the nursery is also somewhat irregular. Poisoned bran mixture has been scattered in all fall seedings to prevent injury from grasshoppers, which are rather numerous.

The Substation was visited this week by Director P. F. Trowbridge of the State Experiment Station and Mr. J. G. Diamond, Agricultural Statistician for North Dakota.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Sept. 27) September, like August, has been a very dry month. The precipitation during September was 0.52 of an inch, while that for August was 0.41 of an inch.

As a result of the drought there is not sufficient moisture in the soil to germinate fall sown wheat. However, wheat sown with the furrow drill on well-prepared summer fallow land will have sufficient moisture to germinate the wheat and bring it up. It is doubtful that any ordinary drill, even on good fallow land, can place the seed sufficiently deep to reach the moisture. Wheat sown in stubble can not germinate before more rain falls. However, unlike the practice of former years, most farmers are sowing their fall wheat in dry soil instead of waiting for more moisture.

All fall sowing on the Substation, including an extensive nursery, has been completed within the last few days. About two or three weeks of outdoor work remains to be done before any tabulation of yields can be presented. I am now cleaning, weighing, and recording weights of the spring-grain nursery material, and after this is done I must store all of the grain produced under the Cereal Project out of reach of mice. The mice already have begun on the sacked grain. All requests for tabulated data must be delayed until after the grain is stored.

Director F. B. Linfield, Mr. A. J. Ogaard, and Mr. Bowden of the Montana Experiment Station, and Mr. Lan Hansen and Mr. A. E. Seamans of the Huntley (Montana) Substation were visitors here during the month. Mr. A. Osenbrug and wife are spending the greater part of this week at the Montana State Fair at Helena, having gone overland in an automobile.

State College of Agriculture, Bozeman (Barberry Eradication, T. N. Christopher) (No report).

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (Sept. 30) The weather during September has been favorable for rice. The Station crop is now drained and harvesting will start about October 6. Some early varieties in the nursery have been harvested and others are ripe at present.

The commercial rice crop on the east side of the Sacramento River is nearly alldrained or draining, and indications are that yields will be good. A few fields of early rice are now being harvested.

I attended the demonstartion at the State Rice Station at Cortena yesterday. They had a fairly good attendance, considering the fact that so many of the growers are busy harvesting or preparing for harvest.

There is quite a large acreage of [illegible] Onsen and Colusa C. I. 1600 sown on the west side of the Sacramento River this year. These are early maturing varieties and considerable harvesting has been done. I saw two thrashers in operation yesterday. The crop looks well on the west side.

The rice crop in the State apparently is considerably better than it was last year.

(Oct. 2.) We had a shower of 0.2 df an inch last night and the clouds are hanging quite low today. These few clouds no doubt will bring back sad memories to many growers.

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (W. W. Mackie) (No report)

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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

Vol. 14 October 20, 1922 No.25

Personnel (Oct.11-20) and Field Station (Oct.1-15) Issue.

PERSONNEL ITEMS

Olaf S. Aamodt, writes to Doctor Humphrey, from Cornell University under date of October 15, as follows:

"I am registered for residence credit toward my Ph. D. Degree with a major in plant breeding and minors in plant pathology and plant physiology. In plant breeding I am taking the seminar and synopsis under the leadership of Dr. Emerson. I am taking genetics under Dr. Fraser. Special attention is given to corn in this course. We are also given cultures of the fruit fly (Drosophila), which we cross and recross. Am also getting Dr. Love's biometry course, which I believe will be a great deal of help in clarifying results and giving them the proper interpretation. In plant physiology I am taking both the elementary and advanced courses from Dr. Knudson. In plant pathology I am taking Dr. Fitzpatrick's course in advanced mycology. This is a two years' course. From Dr. Whetzel I am taking lectures in elementary plant pathology."

In addition to the above, Mr. Aamodt is registered for plant pathology seminar and is taking a course in the reading of scientific German literature under Dr. Whetzel.

The following field assistants employed in barberry eradication in South Dakota since July 1, 1922, have recently tendered their resignations in order to resume college studies: Merton O. Aldrich, Ralph M. Caldwell, Harold J. Enright, Rush B. Locke, Kirk Mears, Lawrence C. Savre, Julian I. Staven, and Glenn L. Walter.

Miss Lois Atkins was appointed clerk, effective October 1, 1922, in the cereal-disease investigations conducted in cooperation with the California Agricultural Experiment Station at Berkeley, Calif. Miss Atkins succeeds Mrs. Pauline I. Pedley, whose recent resignation has been noted.

Keller E. Beeson, State leader in barberry eradication in Indiana in cooperation with the Purdue University Agricultural Experiment Station, was granted permission October 17 to pursue post-graduate study in plant pathology at Purdue University during the current college year.

Maurice W. Buchanan was appointed field assistant in barberry eradication, effective October 2, 1922, with headquarters at Ames, Ia.

Allen R. Burr was appointed October 4, 1922, as field assistant in barberry eradication, with headquarters at Madison, Wis.

Stanley Castell, field assistant in barberry eradication in Indiana, since July 1, 1922, resigned October 7 to take a position as farm manager.

Charles E. Chamblis, [illegible] in charge of rice investigations, returned to Washington October 15 from an inspection of the rice experiments at Crowley, La., and other points in the South.

Ira W. Clokey, has been given an appointment as agent, effective October 16, 1922, to assist in the investigations of crown rust of oats and related grasses that are being conducted in cooperation with the Iowa Agricultural Experiment Station at Ames, Ia. Mr. Clokey has been granted permission to pursue post-graduate study in general bacteriology and genetics at the Iowa State College during the current college year.

Leroy E. Compton, field assistant in investigations with leaf rust, conducted in cooperation with the Purdue University Agricultural Experiment Station, La Fayette, Ind., was granted permission October 11 to pursue post-graduate study in foreign languages and plant pathology at Purdue University during the current college year

Gordon C. Curran, State leader in barberry eradication, with headquarters at Urbana, Ill., arrived in Washington October 13 by airplane from Dayton, Ohio. For the past two years airplanes, furnished by the U. S. Army Air Service, have been used by this Office studying the distribution in the upper air of stem-rust spores of grains and grasses. These planes have been operating from a number of Army air stations throughout the Middle West and the eastern United States. In order to ascertain whether stem-rust spores are present in the air at this season of the year, Mr. Curran left Dayton, Ohio, October 12 in a United States Army De Haviland airplane with Lieut C. H. Filenour, pilot. The flight was made over Ohio, West Virginia, Pennsylvania, and Maryland to Washington, D. C. From Washington the route was along the Atlantic coast to Mitchell Field, L. I., where the plane arrived at 5.[illegible] p.m., the actual flying time from Dayton being five hours and 25 minutes. On the following day the same airplane brought Mr. Curran to Washington. On the trip from Dayton to New York, via Washington, about 30 exposures were made, two glass slides being used in each exposure. The length of these exposures varied somewhat, the average being about 15 minutes. The slides were exposed at altitudes varying from 1,000 to 4,800 feet, and careful notes were made of the points at which each exposure was made. Examination of the slides to determine the number and character of the spores present is now being made in the laboratory at University Farm, St. Paul, Minn.

Mr. Curran returned to Dayton, Ohio. October 20, over the same route. Further flights for the purpose of gathering information on the spore-content of the upper air are being planned for the winter months.

Ray J. Davis has been appointed field assistant in the investigations of take all disease of wheat conducted in cooperation with the Wisconsin Agricultural Experiment Station, Madison, under the direction of H. H. McKinney. The appointment is effective October 16, 1922.

Sherlock M. Dietz, assistant pathologist in charge of investigations of crown rust of oats conducted in cooperation with the Iowa Agricultural Experiment Station, at Ames, Ia., was granted permission October 11 to pursue post-graduate study in plant pathology and genetics at the Iowa State College during the current college year.

Dr. Sophia H. Eckerson, whose temporary appointment as plant microchemist in the cooperative studies on wheat scab at Madison, Wis., was terminated June 30, 1922, was reappointed Oct. 1 as agent in the microchemical research on the resistance and susceptibility of wheat and corn to the wheat scab fungus conducted in cooperation with the Wisconsin Agricultural Experiment Station at Madison, Wis.

Harry L. Edwards was given an appointment, effective October 1, as field assistant in barberry eradication, with headquarters at Madison, Wis.

Donald G. Fletcher, field assistant in the rust survey conducted in cooperation with the Minnesota Agricultural Experiment Station, was granted permission October 11 to pursue post-graduate study in plant pathology at the University of Minnesota during the current college year.

Victor H. Florell, assistant agronomist in charge of cooperative cereal investigations at Davis Experiment Farm, Davis, Calif., was granted permission October 11 to pursue post-graduate study in genetics and botany at the University of California, both at Davis and at Berkeley.

James B. Harrington has been appointed agent, effective October 1, 1922, to assist in the rust-breeding investigations conducted in cooperation with the Minnesota Agricultural Experiment Station at St. Paul. Mr. Harrington has assumed the duties of Mr. Olaf S. Aamodt, now on leave of absence at Cornell University.

Merle T. Jenkins, assistant agronomist in charge of corn-breeding investigations conducted in cooperation with the Iowa Agricultural Experiment Station at Ames, Ia., was granted permission October 17 to pursue post-graduate study in plant physiology and crop breeding during the current college year.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, was called to Lawrenceville, Ill., early in October because of the illness of his father. He writes October 16 that his father died October 13. Before returning to Washington Doctor Leighty will proceed to Granite City, Ill., and St. Louis, Mo., to inspect experiments in the control of flag smut and take-all of wheat, and to La Fayette, Ind., where he will confer with experiment station officials concerning investigations of leaf rusts of cereals.

The appointment of Walter C. Leth, field assistant in the stripe-rust experiments conducted at Moscow, Idaho, under the direction of Charles W. Hungerford, was terminated October 16 upon the completion of his duties.

Moses N. Levine, assistant pathologist in stem-rust investigations conducted in cooperation with the Minnesota Agricultural Experiment Station, was granted permission October 17 to pursue post-graduate study at the University of Minnesota, looking toward a degree of Doctor of Philosophy. The course of study includes plant pathology, plant breeding, and economics.

L. S. Mayer, assistant agronomist engaged in corn investigations in cooperation with the University of Tennessee, at Knoxville, Tenn., was granted permission October 10 to pursue post-graduate study in plant pathology, plant physiology, and genetics at the University of Tennessee during the current college year.

Leonard W. Melander, State leader of barberry eradication in Minnesota, was granted permission October 17 to pursue a post-graduate course of study at the University of Minnesota, looking toward the degree of Master of Science. Mr. Melander's course of study includes plant pathology, plant breeding, genetics, and cytology.

Theodore C. Meldahl, field assistant in barberry eradication in North Dakota since July 1, resigned October 7 to resume his studies at the North Dakota Agricultural College.

Raymond E. Menefee, who has been employed as field assistant in barberry eradication since June 1, 1922, resumed his studies at Purdue University upon the completion of his field duties September 23, 1922.

Lyle E. Mowris, field assistant in barberry eradication, with headquarters at Agricultural College, N. Dak., finished his summers work October 7 and returned to college studies.

Jesse H. Muncie, assistant plant pathologist engaged in barberry eradication in cooperation with the Iowa Agricultural College, has been granted permission to pursue post-graduate study in plant pathology at that institution during the current college year.

William L. Popham, field assistant in barberry eradication in Montana, since June 1, 1922, finished his duties October 11, his resignation being effective on that date.

Charles G. Scearce, who was appointed field assistant in barberry eradication in Indiana, effective September 16, accepted a position as farm manager and tendered his resignation October 7.

Ernest R. Schulz, field assistant in barberry eradication in Wisconsin during the past summer, completed his duties September 30. He was given an appointment as agent, effective October 1, to assist in laboratory experiments in barberry eradication conducted in cooperation with the Wisconsin Agricultural Experiment Station at Madison.

Dr. E. C. Stakman, pathologist, returned from Europe October 19 on the White Star liner "Homeric." He reached Washington the following day and immediately went into conference with the Cerealist and other specialists. In the evening about 30 representatives of the Bureau of Plant Industry gathered at a dinner arranged by Roy G. Pierce, chairman of the evening, to hear Doctor Stakman. At the conclusion of the dinner Dr. C. R. Ball, as toastmaster, introduced Dr. Wm. A. Taylor, Chief of the Bureau, who congratulated Doctor Stakman on his diligent researches during the past five months, and invited him to address the company. Doctor Stakman's recital of some of the difficulties experienced in traveling from one country to another, particularly in southern Europe, the distrustful attitude of some of the railway and customs officials, the suspicions of country people, the uncertain railway schedules, the unsanitary conditions, etc., was amusing and very entertaining.

Doctor Stakman visited nearly every country in Europe with the exception of Russia. There is no doubt in his mind as to the relationship between the occurrence of black stem rust and the presence of the barberry bush. From personal observations and from the statements of pathologists and other experts in England, Germany, and the Scandinavian countries it is certain that where the barberry bush has been eradicated or has never existed, stem rust is practically unknown. The barberry has been generally eradicated from the best agricultural section of the British Isles, with the exception of Wales, and from Denmark, very generally from Germany, Holland, Belgium, France, and also from parts of central Europe. As a result of his careful inquiries and observations he is convinced that the United States should actively push the thorough eradication of the barberry bush, which he unhesitatingly denounces as a "red-handed anarchist."

Arthur P. Swanson, assistant agronomist in charge of cereal investigations at the Hays Branch Experiment Station, Hays, Kans., has been granted leave without pay from October 1, 1922, to June 30, 1923, for the purpose of pursuing graduate study in plant breeding and plant physiology at the University of Minnesota. During his absence Burton B. Bayles, junior plant breeder, at the Kansas Agricultural Experiment Station, Manhattan, will be in charge of the cereal experiments at Hays.

Albert F. Thiel, State leader in barberry eradication in Nebraska, in cooperation with the University of Nebraska, has just been granted permission to pursue post-graduate study at that institution with a view to obtaining a doctorate degree in June, 1923. The course of study includes agronomy and soils

Manly D. Tibbetts was appointed field assistant in barberry eradication, effective October 1, with headquarters at Ames, Ia.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, returned October 11 from an inspection of field investigations of flag smut of wheat conducted at Granite City, Ill., in cooperation with the Illinois Agricultural Experiment Station. Together with Prof. G. H. Dungan he sowed a large number of varieties of wheat in the flag-smut experiment plats. Several seed treatments were used, including some new ones, and a large number of head-to-row selections were seeded with the hope of obtaining resistant selections from rosette-resistant varieties and others desirable for cultivation on a commercial scale in the infested area. Seedings also were made in the over-wintering test plats. The temperature at the time was about 90 degrees and the atmosphere very dusty; rain fell two days after the seeding was finished.

Doctor Tisdale also inspected the laboratory experiments with flag smut conducted at the Missouri Botanical Garden, St. Louis, Mo., by Miss Marion A. Griffiths, assistant pathologist. Together with Prof. B. M. Duggar he outlined a program of flag-smut investigation for Miss Griffiths, who is pursuing post-graduate study at the Garden.

In collaboration with Professor Dungan, at Urbana, Ill., Doctor Tisdale began the preparation of a manuscript on flag smut of wheat to be published as a State bulletin in cooperation with this Office.

Luke P. Vassar has been given an appointment as agent, effective October 1, 1922, to assist in the rust investigations conducted in cooperation with the Minnesota Agricultural Experiment Station, St. Paul, Minn.

William A. Walker, assistant pathologist, engaged in barberry eradication in cooperation with the University of Wisconsin and the Wisconsin State Department of Agriculture, at Madison, has been granted permission to pursue post-graduate study in plant pathology at the University of Wisconsin during the current college year.

The recent temporary appointment of William H. Weston, Jr., as pathologist to enable him to complete certain manuscripts on the results of his studies on downy mildews in the Philippine Islands, was terminated October 9, 1922. He has been reappointed collaborator with this Office, effective October 10.

RUSSIAN SCIENTISTS VISIT THE DEPARTMENT

From October 11 to 13, 1922, inclusive, many workers of the Department had opportunity for conference with two scientists connected with Plant Industry Investigations conducted by the Russian Government. Prof. N. M. Tulaikov, President of the Russian State Institute of Experimental Agronomy at Petrograd, and, for many years previous, the director of the experiment station at Saratov in Southern Russia, is making a tour of portions of the United States and Canada with especial reference to the development of dry-land agriculture in this country. He is greatly interested in soil composition and soil management, especially under conditions of limited or deficient rainfall; but he is interested also in crop production and crop breeding.

Professor Tulaikov was accompanied by Prof. D. N. Borodin, the American Representative of the Russian Bureau of Applied Botany, of which Dr. N. I. Vavilov is chief. Professor Borodin is well known in the Department, which he has visited many times in connection with the interchange of seeds, literature, and other information between the United States and Russia.

On Thursday, October 11, Professor Tulaikov and Professor Borodin addressed a meeting of the staffs of the office of Cereal Investigations, Bureau of Plant Industry, and the various divisions of the Bureau of Agricultural Economics in the assembly room of the latter bureau. Professor Tulaikov spoke at length of the physical, climatic, and crop conditions in Southern Russia, with special reference to the recent severe famine in the Volga River district. He states that the crop of 1922 in the famine area has been a very fair one, and that immediate distress has been relieved, but that there is a great lack of machinery, draft animals and stock animals necessary to the proper restoration of prosperous agriculture in Southern Russia. Transportation conditions also are not yet sufficient to enable the desirable distribution of food supplies. He spoke also of efforts being made to develop more frost-resistant varieties of wheat and wheat-rye hybrids. Under present conditions, rye is grown much further north in Russia than it is possible to grow present varieties of wheat.

Professor Borodin spoke with reference to the general crop and crop improvement conditions in Russia, and more particularly concerning the Russian scientific expedition to Mongolia during the current year. This was a preliminary expedition, which it is planned to follow by a larger and more completely organized expedition in 1923, in which the presence of an American cereal specialist is desired. This expedition should give opportunity for making a very complete survey of the early and cold-resistant cereal varieties likely to be found in that little-known portion of northern Asia.

MANUSCRIPTS AND PUBLICATIONS

Galley proof of Farmers' Bulletin 1305, entitled "Soft Red Winter Wheats," by C. E. Leighty and J. H. Martin, was read October 13.

Galley proof of Farmers' Bulletin 1304, entitled "The Durum Wheats," by J. Allen Clark and J. H. Martin, was read October 16.

Page proof of Farmers' Bulletin 1231, entitled "The Hard Red Spring Wheats," by J. Allen Clark and J. H. Martin, was read October 16.

An article entitled "Kota Wheat," by J. Allen Clark, agronomist in charge of western wheat investigations, was approved Oct. 17 for broadcasting by radio.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hammerly) (No report)

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor) (No report).

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love) (No report).

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (Chas. E. Chambliss) (Oct. 19).

Louisiana has a rice acreage of 554,402 acres this year, of which approximately 480,000 acres are located on the prairies in the southwestern part of the State. The total acreage for the State last season was 482,540. With an increased acreage of approximately 62,000 acres, it is estimated that the probable production this year will be 18,335,000 bushels as compared with 16,560,000 bushels last season.

Continuous rains throughout the prairie section during the first two weeks in September have delayed the thrashing of the early maturing rices and prevented the harvesting of the late maturing ones. The yields that have been reported are fairly satisfactory, but the quality of the grain has been badly affected by wet weather. With good weather throughout this month for thrashing, there should be no losses over a large area that would reduce the average yield of the State below 34 bushels per acre. To date, the prices for rough rice have ranged from 1.8 to 2.6 cents per pound.

The Louisiana Farm Bureau Rice Growers' Cooperative Association, which was organized at Crowley, La., September 12, has leased the mill and warehouse of the Federal Rice Milling Co., Crowley, La. The mill has a capacity of 2,000 barrels a day, and the warehouse a storage capacity of 150,000 bags. The mill will be operated exclusively for the members of the Association. A charge of 40 cents a barrel will be made for the milling of the rough rice. The Association is advancing 60 per cent of its value to its members when they deliver the rice at the mill or warehouse. The valuation is fixed at $3.30 a barrel on grades No. 1 and No. 2 of Blue Rose. It will sell the cleaned rice for its members and return or sell at the option of the individual member all bran, polish, and second-hand sacks. The Association expects to control over one million bags of this year's crop.

Harvesting at the Station has progressed rather satisfactorily though repeatedly interrupted by rains. The bad weather delayed field operations but has not caused any losses. The last of the rice plats were harvested and shocked October 6. The greater part of the nursery is yet to be harvested.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (Oct. 17). On October 13 we finished harvesting our comparison plats of selfed and crossed strains of corn and later assisted Professor Essary in seeding the wheat plats in the experiment conducted by Doctor Leighty and Doctor Mains.

IOWA

Agricultural Experiment Station, Ames. (L. C. Burnett) (No report)

Iowa State College, Ames (Barberry Eradication, J. H. Muncie) (September report) The majority of the field men resigned the latter part of September to take permanent positions or to return to college. The State leader together with N. F. Thompson, has been supervising chemical treatments in northeastern Iowa. An area of 600 escaped bushes near Decorah has been treated with salt and arrangements have been completed for the treatment of all bushes in an area near McGregor. Field Assistant A. G. Hill has been transferred to assist N. F. Thompson in experiments with chemical eradication.

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (Benjamin Koehler)(Oct. 13) Seeding in the wheat plats has just been finished. Of the 650 selections from Turkey Red wheat made three years ago all but the most desirable ones have been discarded. This summer 4,000 new head selections for scab resistance were made. After the heads were thrashed a further selection was made and the number was reduced to 2,000. These have been planted. An effort will be made next season to produce a high percentage of scab infection in this plat so that scab resistance, if any, can be more readily determined.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) On September 30 the last field man resigned; most of the men left about September 15 to enter college.

It is planned to spend considerable time this fall in checking over plantings of common barberry that have not yet been reported removed. Every effort will be made to close the year's work with as many bushes removed as possible.

A number of barberry plantings in the vicinity of Galena will be treated with chemicals by Noel F. Thompson the last part of October.

Work with the Army Air Service in the collection of stem rust spores is progressing very nicely. A trip was made from Dayton, Ohio, via Washington D. C., to New York City and return. Frequent flights will be made over Illinois, Indiana, and Ohio during the winter months to ascertain whether or not stem rust spores are present in the upper air.

It is planned to establish three rust stations in Illinois this winter for the purpose of making observations on the overwintering of uredinia of [illegible]. These stations probably will be located at Cairo, Urbana, and Chicago.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

Purdue University, College of Agriculture (Barberry Eradication, M. E. Beeson) (September report) Since the first of September most of the time has been given to the preparations of plats for epidemiology studies. Plats have been planted at Greensburg, Terre Haute, Evansville, and at Purdue University Experiment Station, La Fayette.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (September report) President Friday of the Agricultural College granted the privilege of late registration to all field men who wished to attend college this fall. By means of this cooperation the entire field force was continued until September 30. Two men will continue resurvey during October. The State Leader has been in conference with W. F. Thompson and they have visited escaped areas with a view to making chemical treatments.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, William A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul, (Barberry Eradication, L. W. Melander) (September report) Conditions for survey during the month of September were quite favorable. Eight counties were finished in the original farm-to-farm survey, namely, Benton, Carver, Rice, Scott, Sherburne Steel, Wa seca, and Winona. A total of 4,318 bushes was found on 265 properties Of these 1,195 were found escaped from cultivation in eight counties, while 3,093 were removed from 315 properties. Southeastern Minnesota will be complete in the original survey this season. It is in this part of the State that the highest number of barberry bushes per square mile has been found. Fillmore County will be finished by the end of October. The survey of this County is progressing very slowly as there are many escaped bushes. Practically the whole county had to be scouted on foot.

Barberry demonstartions were put on in cooperation with the Conference for the Prevention of Grain Rust at all county fairs held during the month. Two demonstrations were placed at the Minnesota State Fair, -one in cooperation with the State Department of Agriculture and the other in cooperation with the Conference for the Prevention of Rust. These demonstrations were located in different parts of the fair grounds so that nearly all those in attendance

saw one or more of them. One fact was very plainly brought out, namely, that the increased publicity this year had made its impression on the general public. This year a considerably higher percentage seemed to have read or heard about the common barberry and were quite interested. A frequent remark heard among the people was, "Oh, here is the common barberry. I want to see what it looks like so I can tell if I have any." The number of "doubting Thomases" also seemed to be considerably less than in previous years.

Preparations are now in progress for the barberry demonstration at the National Dairy Show which is to be held at the State Fair Grounds, October 7 to 14.

Not so many counties were included in the farm-to-farm survey of 1922 as in that of 1921, but the area of the State having the most barberries was covered. We now have a comprehensive idea of what we have to contend with to rid this State of the common barberry.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (No report)

Hays Branch Experiment Station, Hays (B. B. Bayles) (Oct. 15) No rain was recorded here during the first two weeks of October, and none of the wheat has germinated yet.

Threshing of sorghums from the cereal project was completed the first week of October. All the seed has been recleaned and notes and test weights taken. The yields have not been calculated yet.

The fall work has been practically completed here and the writer expects to go to Manhattan this week to assist John H. Parker during the winter months.

The writer was at Colby, Kans., Oct. 6 and 7 to assist in the planting of a winter hardiness wheat nursery. Conditions in that section are more favorable than at Hays. Much of the wheat on fallow has germinated. Some damage has been reported from the false wire worm.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (No report)

Agricultural College, Ft. Collins (Barberry Eradication, T. A. Lungren for John R. Fitzsimmons) (October 1) One of the three field men employed in Colorado during the past summer has continued resurvey in the city of Denver. The State leader, John R. Fitzsimmons, has gone to Harvard University to complete his graduate study. Mr. Lungren has accepted a position with the Botany Department of Colorado Agricultural College.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication A. F. Thiel) (September report) The majority of the field assistants were released September 30. Eight men will be continued through October, -two carrying on original surveys and six making resurveys. Resurvey data compiled during September show that six to 45 per cent of the bushes removed in original surveys have sprouted.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (No report).

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (Oct. 6). Doctor Humphrey and Doctor Kempton visited Brookings during the latter part of August and the first part of September. Dr. Kempton conferred with some of the field men in Brown County and visited a number of plantings between Aberdeen and Sioux Falls.

An equivalent of 17 men was employed during the entire month of September. The work was somewhat interrupted, however, because a number of the men returned to college and new men had to fill their places. Eight and one-half counties were finished in original survey and three counties were resurveyed during the month. A total of 796 bushes was found and 699 bushes were removed. Only one and three-fourths counties east of the Missouri River are yet to be surveyed before winter in order to completely clear up the original survey in the eastern half of the State.

Demonstrations were held at the South Dakota Fair at Huron, the Tri-State Fair at Aberdeen, Corn Palace at Mitchell, Alfalfa Palace at Rapid City, and the Minnehaha County Fair at Sious Falls, Increasing interest is being shown in eradication. Several plantings were reported by interested persons to the men in charge of the demonstrations. It was very noticeable that many people in South Dakota still are under the impression that the barberry bush is a weed which grows wild in the grain fields. Considerable surprise was exhibited by spectators when they found that the bush sometimes grows nine to 15 feet tall. Offers of cooperation by bankers and merchants over the entire State were very general and probably will mean a great deal to our work in the future.

The resurvey during the month shows that a number of bushes that were not sprouting in the spring and early summer sent up small sprouts within the last month and that probably 50 per cent or more of the old plantings will need attention again next spring.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College, (W. P. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. E. Mayou) (September report) Seven men are to be continued through October; the appointments of the others were terminated September 30. Very successful demonstrations, of interest to both farmers and townspeople, were held at the State and Interstate fairs, county fairs, farmers' conventions, and public buildings, and on farms where bushes had been located.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.)
(No report)

Dickinson Substation, Dickinson (Ralph W. Smith) (Oct. 10) The summer weather suddenly came to an end with the first killing frost of the season on the morning of October 8. This is the latest date for the first killing frost at Dickinson during the 30 years that weather records have been kept. The latest killing frost last spring occurred in April, making the frost-free period nearly two months longer than usual.

The cereal nursery was thrashed last week, thus ending the thrashing for the year. Stand notes have been taken on the winter-wheat nursery consisting of about 2,100 rows, and also on the plats of winter wheat and rye. The stand of winter wheat in standing corn is good, while that in the grain stubble is rather thin due to the dry condition of the soil.

There has been scarcely any rainfall during the past month. A little snow fell yesterday. The temperature probably will be about 10 degrees above zero in the morning as it is now dropping fast.

Superintendent Mcomaw attended the National Dairy Show in St. Paul last week and the Plant Production Conference at the North Dakota Agricultural College.

Thrashing in this vicinity is nearly finished. It is later than usual because of a shortage of thrashing machines and lack of help in some cases. The weather has been unusually favorable for thrashing.

The acreage sown to rye in this locality is rather small so far, due to the dry condition of the soil, and other farm work needing to be done.

Superintendent Downey of the Hettinger Substation was a visitor last week while on the way to the Dairy Show.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (Oct. 1) Arrangements are being made to conduct epidemiology studies during the winter and spring at Glendive, Forsyth, Billings, Bozeman, Lewiston, Sheridan, and Hamilton.

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (Fred W. Briggs) (No report)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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October 31, 1922

Vol. 1- No. 26

Personnel (Oct. 21-31) and Project Issue.

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PERSONNEL ITEMS

Anton H. Berkman, Charles E. Brockhart, and Kenneth E. Grant, who have been employed as field assistants in barberry eradication in Iowa since July 1, 1922, have tendered their resignations and returned to college studies.

The following field assistants, employed in barberry eradication in South Dakota since July 1, 1922, tendered their resignations at the end of September and returned to their studies at the South Dakota College of Agriculture; Raymond Bulger, Theodore Kurtz and Walter H. Michaels.

Benjamin H. Duddleston, scientific assistant in the investigations of corn root, stalk, and ear rots conducted in cooperation with Purdue University Agricultural Experiment Station, La Fayette, Ind., was granted permission October 26 to pursue post-graduate study at Purdue University looking toward the degree of Doctor of Philosophy. The course of study will include cytology and a foreign language.

Ira S. Holdinott, field assistant in barberry eradication in Ohio, since July 1, 1922, has accepted the position of county agricultural agent of Belmont County, Ohio. His resignation is effective October 10.

Charles R. Hursh, agent, cooperating with the Department of Plant Pathology University of Minnesota, on the problem of the biochemical nature of the resistance of wheat to stem rust, was granted permission to pursue post-graduate study in plant pathology at the University of Minnesota with a view to obtaining the degree of Doctor of Philosophy.

The following men, employed as field assistants in barberry eradication in North Dakota during the past summer, resumed the full course of study at the North Dakota College of Agriculture, having tendered their resignations, effective October 15: Hilmer E. Kjerlie, Glen C. Oberman, Linfield C. Tarbell, Seth A. Welch, and Bert Wick.

Dr. C. E. Leighty, [illegible] in charge of cereal [illegible] investigations, returned to Washington October 25 from official visits in Illinois, Missouri, and Indiana.

R. W. Leukel, assistant pathologist, engaged in the investigations of the nematode disease of wheat and the Helminthosporium diseases of barley, was taken suddenly ill October 29 and operated upon for appendicitis early the next morning. He is at the George Washington University Hospital, in this city, and is reported as recovering rapidly.

Mrs. Florence T. Nichols, nee Willier, assistant pathologist in the investigations with crown rust of oats, in cooperation with the [illegible] Experiment Station, at Ames, Ia., has tendered her resignation effective October 31, in order to give her time to household duties.

[illegible] in charge of barberry eradication in Michigan [illegible] permission [illegible] to pursue post-graduate study in botany at the Michigan Agricultural College, during the current college year.

John G. Willier, assistant agronomist in corn investigations, was granted permission October 25 to pursue post-graduate study in philosophy, research methods, and statistical methods at Research University, Washington, D. C., looking toward the degree of Master of Arts.

VISITORS

Señor Don G. H. Bèeche, attaché of the Costa Rica Legation, accompanied by Señor Carlos A. Vallejo, agricultural attaché of the Argentine Embassy, called at the Office October 26 to obtain seed of wheat varieties adapted to the conditions peculiar to Costa Rica.

Mr. Francis G. Wickware, representing D. Appleton and Co., of New York City, was an Office visitor October 24 to inquire about the possibility of obtaining photographs of the Russian steppes.

MANUSCRIPTS AND PUBLICATIONS.

An article entitled "The Cereals," by Dr. C. R. Ball, was approved October 21 for publication in the Young Peoples Encyclopedia of Agriculture, Bellows-Reeve Company, Chicago, publishers.

Galley proof of Farmers' Bulletin 1303, entitled "The Club Wheats," by J. Allen Clark and J. H. Martin, was read October 24.

Page proof of Farmers' Bulletin 1127, entitled "Some New Varieties of Rice," by Charles E. Chambliss and J. Mitchell Jenkins, was read Oct. 28.

Page proof of Farmers' Bulletin 1301, "The Common White Wheats," by J. Allen Clark, J. H. Martin and C. E. Leighty, was read Oct. 25.

1921 YEARBOOK

The Yearbook of the Department of Agriculture for 1921 is now being distributed. A copy has been requested for each field man of this Office. The supply for such distribution is small, however. With a desire to conserve copies of the 1921 Yearbook, which contains unusually valuable articles, it is requested that those who receive copies both through this Office and from their Congressmen kindly return such duplicates to the Office here. The franking privilege may be used, of course, for this purpose.

JOURNAL AGRICULTURAL RESEARCH

Everyone will be delighted to know that authority to resume publication of the Journal was given by the Budget Bureau on October 19.

MISCELLANEOUS MEMORANDA

A NEW METHOD FOR PROMPT HANDLING OF FIELD PAYROLLS.

October 21, 1921.

Memorandum For Field Employees.

Gentlemen:

Your attention is called to the inclosed memorandum from the Chief of the Bureau of Plant Industry.

Pay rolls of permanent field employees will be prepared in this office on or about the 20th of each month.

Leaders or others in charge should report by night telegraph not later than the night of the second day before the close of the month, that is, on the 28th or 29th, any changes that should be made in the pay roll of permanent employees.

Changes occurring earlier in the month should be reported as soon as known, in case of death, resignation, or leave without pay.

This is a definite endeavor to enable field employees to get their checks more promptly. Failure to cooperate may make necessary a return to the old system.

Time of temporary employees should be reported by telegraph on the last day of the month as heretofore.

Very truly yours,

(Signed) C. R. Ball,
Cerealist in Charge.

Memorandum for Heads of Offices.

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Gentlemen:

In order to expedite the payment of permanent employees of this Bureau stationed in the field, the following procedure has been arranged with the Disbursing Office:

Field pay rolls of permanent employees should be forwarded to the Office of Records of this Bureau as promptly as possible after the 20th of the month and not later than the 25th. They will at once be audited, entered and forwarded to the Disbursing Office for recording and for the writing of the checks. The checks will then be held until the last day of the month, when we will file with the Disbursing Office our certification of the pay roll, together with any changes that may have occurred since the preparation of the original draft of the pay roll. On receipt of this certification, the checks will be mailed.

In order to make this plan a success, it is important that we have the heartiest cooperation of the offices. In preparing the original draft of the pay roll, it will be well to leave off any names about which there is any uncertainty as to their completing the month's service without interruption. The Office of Records should be advised promptly of any changes made necessary so that they may be transmitted to the Disbursing Office on the last day of the month, together with our certification of the pay rolls, and before the checks are mailed.

It is very important that the number of changes to be made after the checks have gone forward be held to the absolute minimum, and it will be necessary to hold the offices responsible for keeping the Office of Records informed of all changes promptly.

Very sincerely,

(Signed) Wm. A. Taylor.

Chief of Bureau.

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CEREAL SEMINAR, UNIVERSITY OF WISCONSIN.

Under date of Oct. 7, Dr. James G. Dickson describes their cereal seminar, as follows:

Last year we reviewed some of the literature on the morphology, anatomy, and physiology of the cereal seedlings. With this literature review we germinated the seedlings and attempted a comparative study of the fresh and fixed materials, thereby checking the results recorded in the various publications.

The seminary group met every Friday afternoon from 4:30 to 6:00 and, as stated previously, consisted of the Cereal Office staff and such members of the University Botany Department staff as cared to join us from week to week. Dr. Eckerson, who has been a member of our staff the past two years, and Dr. Kraus were in regular attendance at the seminary.

The program of discussion was arranged for the semester. Each member was assigned a special phase of the study. These individuals reviewed the literature, prepared the comparative material, and led in the discussion of the literature and demonstration of the material. After this brief presentation, usually lasting thirty minutes, the material was examined and an informal discussion occupied the remainder of the afternoon.

Permanent mounts of the material were prepared together with the drawings and photomicrographs of the material with the definite aim in view of eventually collecting sufficient material to offer as a publication on the morphology, anatomy and physiology of the cereal plants.

The present year we are organizing a seminary on the embryology of the cereal kernel. This will be conducted as previously described for the past years seminary and will, I hope, give us a better insight into the comparative morphology, anatomy and physiology of the embryos of the important cereal crops

The study is surely stimulating and educational. The scientist working with our field crops has little to draw upon from accurate, detailed papers on these subjects, therefore, we are attempting to not only obtain a survey of published data, but check it with a critical study of the plant tissues grown under controlled conditions. We are also gaining much in sectioning, staining and dissecting technique.

I could give you many pages more of the results we have obtained, but feel that this brief survey will give you some idea of what we are accomplishing and somewhat of our plans for the coming year. I feel personally that such a discussion group, while on subjects somewhat afield from our special appointments, has better equipped us to cope with our individual problems whether they be wheat rosette, corn root rot, take-all, wheat scab, or what not. Further, these discussions have fostered a research spirit very much worth while.

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218 D. RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Pathologist in Charge)

Stem Rust Investigations. (Dr. E. C. Stakman, Pathologist in Charge)

Barberry Eradication Controls Stem Rust In Europe

Dr. E. C. Stakman, Plant Pathologist of the Minnesota Agricultural Experiment Station and Agent of the United States Department of Agriculture in Cooperative Investigation of Black Stem Rust of Wheat returned from Europe on October 19 on the White Star Liner "Homeric" after five months of travel and study of the relation of the common barberry and its eradication to the development of black stem rust. The trip was taken for the Office of Cereal Investigations of the Bureau of Plant Industry and covered practically every country of Europe with the exception of Russia. After this extensive and careful investigation, Dr. Stakman is more than ever enthusiastic over the eradication campaign now in progress in this country. His conclusions are expressed as follows:

Practically all plant pathologists in the United States who are at all conversant with the facts confidently expect that the successful completion of the barberry eradication campaign will greatly reduce the losses caused by the black stem rust of wheat, oats, barley, and rye. Furthermore, it seems perfectly clear that the common barberry must be eradicated or the rust will make it almost impossible to grow grains profitably in many sections of the upper Mississippi Valley. On the basis of European experience, both of these conclusions seem inescapable.

The common barberry has been so thoroughly eradicated from many of the best grain growing regions of Western Europe that the black stem rust is no longer the dreaded disease it once was. In many regions the rust has been almost completely starved out by the destruction of the barberry and in many other regions it now appears only so late in the season as to do no damage. The rust is destructive only where there still are barberry bushes.

There are very few barberry bushes in the most important grain-growing regions of Hungary, Austria, Czecho-Slovakia, France, Holland, Germany, England, and Denmark. As a result of experience, education, and legislation, barberry eradication has been in progress for many years. Many local ordinances and laws requiring the removal of barberry were passed in German states between 1879 and 1890. A barberry eradication law was on the statute books of the old Austro-Hungarian Empire as early as 1893, and the present Hungarian State two years ago made legal provision for the removal of the remaining bushes. Many of the local governmental units of France also issued orders compelling land-owners to remove the barberry. The preamble to one of these orders issued by the Prefect d'Eure Et Lair, April 7, 1891, reads as follows: "Whereas it is established that the proximity of the common barberry is a veritable scourge (bleau) to cereals since it permits the development of the black rust - -".

The Danish barberry eradication law of 1903 is well known; and recently Bavaria, Norway, and Sweden also have enacted barberry eradication laws. It is difficult to find the common barberry bush in rural England, but, curiously enough, there is no law requiring its destruction. An eminent English pathologist, when asked how the eradication had been brought about, replied that English farmers had too much sense to tolerate the common barberry. A prominent Dutch pathologist, when asked why there were practically no barberry bushes in the country districts of Holland replied that there was such a small area in his country to feed 7,000,000 people that they couldn't afford to grow barberries. And, indeed, he spoke wisely and well because it is perfectly clear that the common barberry is as dangerous in Europe as it is in this country.

The following facts may be regarded as established: (1) The common barberry is capable of doing damage in every country of Europe. (2) The only destructive rust epidemics in Western Europe are found near common barberry bushes, even in the southern countries where one would expect the red stage to live through the winter. (3) As the barberry bushes have been eradicated, rust has decreased in severity. (4) Europe will never be entirely free of black stem rust because it would be impossible to eradicate all of the barberry bushes from the forests and mountains.

In England it is practically impossible to find any black stem rust on grains except near barberry bushes; in fact, British pathologists are convinced that rust cannot exist in that country without the common barberry. Nothing could be clearer than the dependence of the rust on the proximity of barberry bushes. It was impossible to find any rust on grains in France up to the middle of June except near common barberry bushes. At that time an extended search was made in the principal grain-growing districts but not a trace of black stem rust could be found. However, in the Alps, where there still are a great many barberry bushes, the rust had already developed abundantly on grains and grasses in the immediate vicinity. Even in Spain, where the winters are mild and one would expect the red stage to live during the winter, there is a very definite relationship between barberry and rust. The rust always appears earliest and does the most damage near the bushes.

In Italy the situation is similar. The black stem rust is feared only in the northern part of the country where there still are a great many barberry bushes in the mountains. There also are many bushes in the mountains of Greece, where, again, the relationship between the presence of these bushes and the development of rust is perfectly evident, even to an inexperienced eye. Wild barberries are common all through the Balkan States. Here, also, the relation is very clear.

On account of the fact that the mountain ranges of western Europe extend both from east to west and from north to south there are many grain-growing areas bordered by barberry bushes. In these areas, such as in the Jura mountain region, for instance, it is quite evident that the black stem rust is much more prevalent than in those regions in which there are no bushes.

There can be no question but that the severity of rust attacks has decreased with the eradication of bushes. There is conclusive evidence that black stem rust formerly did a considerable amount of damage in England. However, since practically all of the barberry bushes have been removed the rust scarcely ever develops. In Denmark, practically all of the common barberry bushes have been eradicated. When rust occurs in that country now, it is always near barberry bushes which have escaped notice. Prior to 1903, when the barberry bushes were eradicated, there were frequent and severe epidemics of rust in Denmark. In the 12 years preceding 1903, there were six destructive epidemics in Denmark. In the 19 years since 1903 there has not been a single destructive epidemic. In fact, in 10 out of 19 years there was scarcely any rust whatever and in the other 9 years only a trace of it could be found here and there. One can drive for miles in Denmark without finding the slightest trace of black rust. However, in the vicinity of patches of woods and wastelands, where there still are barberries, the rust continues to develop.

In order to be convinced of the effectiveness of controlling rust by barberry eradication it is only necessary to compare the conditions in Denmark with those in Sweden and Norway. While there are barberry eradication laws in these two countries they were passed so recently that there yet remain very many bushes. The grains and grasses near these bushes were universally black with rust this year. Furthermore, in those districts where there were many barberry bushes there was a heavy epidemic of rust, wheras, in those districts where barberry bushes were scarce, the grain was practically free.

Barberry bushes are, and probably always will be, very numerous in the mountains of Norway, Sweden, Southern Germany, Austria, Switzerland, in the Pyrenees Mountains, in the Alps, Apennines, Balkans, Transylvanian Alps, Carpathians, and the lesser mountain ranges of Europe. Early in the season, when there is no rust whatever on the plains, the rust is severe in the neighborhood of barberries at elevations up to 4,000 to 5,000 feet. In these mountain-districts, possibly the rust may be blown to some extent to the grain fields on the plains. It would be impossible to eradicate all of these bushes in the mountains and therfore, Europe never will be free from rust. The complete eradication of the bushes from even such small areas as England and Denmark has protected those countries from rust epidemics. Furthermore, there is substantial evidence to show that the same thing has happened in France and Germany and on the plains of Austria and Hungary. On account of the topography of the country and the consequent impossibility of removing all barberry bushes, rust cannot be entirely eliminated, but its teeth have been pulled so that it is no longer able to destroy enormous quantities of grain as it did in former years. A similar dental operation is now being performed in this country and it is to be hoped that it will be completed as rapidly and as thoroughly as possible.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol.14 November 10, 1922 No.27
Personnel (Nov. 1-10) and Field Station (Oct. 16-31) Issue.

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PERSONNEL ITEMS

The following field assistants in barberry eradication in North Dakota since July 1, 1922, completed their duties September 30: Verne R. Archer, Ronald C. Bentley, Earl G. Ferguson, William B. Gass, Leonard N. Severson, and Vernor H. Trowbridge.

Arthur A. Bryan, junior agronomist in the investigation of corn improvement in cooperation with the Iowa Agricultural Experiment Station, was granted permission November 3 to pursue post-graduate study at the Iowa State College, looking toward obtaining the degree of Master of Science. The course of study will include biometric methods, plant breeding, and cytology.

The following field assistants engaged in barberry eradication in Iowa for varying periods during the past six months have completed their duties and tendered their resignations: Maurice W. Buchanan, Fred A. Mackenzie, Frank J. Rutter, Howard W. Sechrist, Manly D. Tibbetts.

Ross D. Davies and Leonard A. Thune, field assistants in barberry eradication in South Dakota since July 1, 1922, completed their duties September 21 and 15, respectively, their resignations becoming effective on these dates.

Luther A. Frost, field assistant in barberry eradication in Nebraska since July 1, 1922, resigned October 31 and resumed studies at the Nebraska College of Agriculture.

Herbert K. Gilhams, employed as field assistant in barberry eradication since August 14, 1922, with headquarters at La Fayette, Ind., completed his duties September 8 and tendered his resignation effective on that date.

Clarence L. Jensen, field assistant in barberry eradication in North Dakota completed his duties October 23 on which date the appointment was terminated.

Henry N. Kaldahl, Walter O. Lutz, Alfred L. Sjowall, and Walter E. Youngdale, field assistants in barberry eradication, with headquarters at St. Paul, Minn., completed their duties October 31, on which date the appointments terminated.

Dr. F. D. Heald, pathologist in charge of barberry eradication, left Washington November 6 to attend the annual meeting of the Conference for the Prevention of Grain Rust at Minneapolis, Minn. Later he also will visit one or two of the States where barberry eradication has been in progress during the past summer in cooperation with State agricultural colleges and other agencies. In these States he will confer with State leaders and assistants and with college and State officials with reference to future plans for the barberry eradication campaign.

R. W. Leukel, whose operation for appendicitis was mentioned in the last issue of the Courier has made such a splendid recovery that he is expected to leave George Washington University Hospital either Saturday of this week or Sunday, November 12.

Cyril H. Mains was appointed field assistant in barberry eradication, effective October 16, 1922, with headquarters at East Lansing, Mich.

Charles S. Reddy, assistant pathologist in the investigation of bacterial and other corn diseases, was granted permission November 8 to pursue post-graduate study in plant pathology at the University of Wisconsin, looking toward the degree of Doctor of Philosophy.

Francis T. Trumbull, field assistant in barberry eradication in North Dakota since July 1, 1922, resigned October 21 and resumed study at the North Dakota Agricultural College.

Harry E. Weakly, who has been employed as field assistant in barberry eradication in Nebraska since July 1, 1922, completed his duties September 30, when his resignation became effective.

VISITORS

Dr. J. C. Walker, pathologist of the Office of Cotton, Truck and Forage-Crop Disease Investigations, who has recently returned from an extensive trip in Europe, conferred with members of the staff of this Office November 6 and 7. He brought specimens of Helminthosporium diseases of barley and certain rusts and smuts of other grains collected while in Spain.

MANUSCRIPTS AND PUBLICATIONS

A paper entitled "The Toxicity of Copper Sulphate to the Spores of Tilletia tritici (Bjerk.) Winter," by Fred N. Briggs, was transmitted November 1 for publication in The Journal of Agricultural Research.

A manuscript entitled "Rice Experiments on the Biggs Rice Field Station, Biggs, Calif.," by Jenkin W. Jones, was transmitted November 2 for publication as a professional paper in the Department of Bulletin series.

A brief paper entitled "Occurrence of Bunt in Rye," Dr. E. F. Gaines and F. J. Stevenson, was approved November 6 for publication, without compensation, in Phytopathology. This paper presents results of some research which in part was cooperative with this Office.

Galley proof of the third revised edition of Farmers' Bulletin 1058, entitled "Destroy the Common Barberry," by Dr. E. C. Stakman, was read November 9.

Page proof of Farmers' Bulletin 1303, entitled "The Club Wheats," by J. Allen Clark and J. H. Martin, was read November 10.

FIELD STATION CONDITION AND PROGRESS

NORTH ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (No report)

SOUTH CAROLINA

Pee Dee Substation, Florence (J. H. Hammerly) (No report)

VIRGINIA

Arlington Farm, Rosslyn (Cereal Project, J. W. Taylor) (Oct. 19) Fall seeding has been in progress for the past three weeks and at the present writing most of the drilling has been finished. Because of the continued drought seeding of wheat and rye was delayed several days past the usual date. All seed used in the oat and barley plats was treated with formaldehyde, and the wheat seed for the varietal plats was dusted with copper carborate. It is hoped that one of the mercury will prove as effective for controlling bunt as is the copper carborate method, for the latter chemical appears to be a strong irritant to the mucous membrane of the throat and nasal passages. In varietal experiments where bellows are necessary for cleaning the drill between varieties i.e., the copper carbonate dust is unpleasant and perhaps injurious to the operators.

Oat stands are on the whole good. The barley germination is more irregular because the soil was heavily crusted after the rains and the plumule had and still has difficulty in making its way to the surface.

Wheat sown September 15 has tillered heavily and leaf rust has started on the seedling leaves. The seed treatments for the smuts of oats and barley and bunt of wheat occupy 82 plats. The barley plats in this experiment are badly in need of rain to soften the surface crust.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (Oct. 25) The sowing of our rod rows and field plats of wheat was completed September 23. This was followed by about two weeks of dry weather which was unfavorable for growth. However, a very good stand was obtained and recent rains will enable wheat to go into the winter under very favorable conditions.

Our yield test on wheat, oats, barley, and rye this season consisted of about 13,000 rod rows, the thrashing of which has been a very lenghty process. The oat thrashing is now about completed and only the barley remains to be thrashed.

The hybrid wheat to be sown at Davis, Calif., is now about ready to send out. This material consists of about 700 5-foot rows sown for individual plant study from crosses of Triticum polonicum on emmer, durum, winter, and spring wheat, also many plants from a cross of wild wheat x T. polonicum. These plants are from a type selected from the fourth generation plants, having a kernel very much longer than either parent, about three times the length of ordinary wheat.

The rod row-test will consist of 200 rows, a continuation of the durum x winter wheat crosses which have been grown there the last three years. Five hundred head rows will be tested for their value as new types of wheat. Three hundred of these heads are from the fourth generation plants of the cross Red Clawson x T. polonicum and represent some new and very promising types of wheat. The other 200 are from crosses of club wheat on spring and winter wheats.

The greenhouse planting consisted of many F_1 hybrids of wheat and oats. Material for making other crosses this season is now being prepared.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (Nov. 1) All rices on the Station have been harvested with the exception of a few late-maturing varieties in the nursery. Soybeans are maturing rapidly and yesterday we harvested some of the Biloxi. The indications are that yields will be good. Biloxi soybeans from Vermilion Parish took first and second prizes at the State Fair.

At the Louisiana State Fair held at Shreveport, La., Oct. 19-23, the Louisiana State University had a rather complete exhibit, probably the best that has been made by the University and theexperiment stations since I have been attending the annual fairs. Ten booths were devoted to project of the experiment stations; the one devoted to rice contained only the exhibit from the Rice experiment Station. The rice samples and the pictures made a rather creditable showing. The exhibit was not a Rice Experiment Station exhibit, but the outline of experiments, which was placed in a very conspicuous position, emphasized the work of the Station in cooperation with the Federal Department of Agriculture. Many inquiries were received from visitors and some correspondence has since resulted.

The American Rice Growers' Association has asked the Rice Experiment Station to make a rice exhibit for the fair at Beaumont, Tex. W. G. Lovell, of Beaumont, also has applied for some of our varieties for exhibit purposes. Panicles and seed of 10 of our leading varieties, together with a short statement as to growing period and yields, have been sent both to the American Rice Growers' Association and to Mr. Lovell. The Station also has been asked to make an exhibit at a fair to be held at Jennings, La., November 8 to 11. Some of the material shown at Shreveport will be duplicated, and soybeans also will be featured.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (Oct. 20) During the first week of October the weather was favorable for maturing crops and the corn crop all over the state is now safely matured. Most of it has been harvested. Wheat seeding in the northern part of the state was practically complete about the first of October, but in the eastern and southern sections plowing and seeding were delayed by lack of moisture. General rains fell on the 6th and 7th and wheat seeding has now been practically completed all over the State.

We have finished our fall nursery plantings on the station field. In addition to the regular varietal experiments and improvement work these include experiments with varietal mixtures, variation in yield and disease resistance between strains of the same variety, inheritance studies, and a seeding of winter oats for selection.

The results of our experiment with wheat varietal mixtures during 1921-22 are summarized below. Five mixtures were grown, each made up of equal parts by weight of the seed of four productive varieties or strains. In addition, a "continuous" mixture, grown from the seed harvested from the mixture in the preceding season, was included. Each variety and mixture was grown in five distributed three-row plots. The yields were as follows:

Constituents	Yield	Constituents	Yield
Harvest Queen	24.48	Ave. of Constituents	22.44
Mich. Wonder	25.04	Continuous mixture	19.80
Fulcaster	18.72	New Mixture	22.44
Nigger	23.52		
Mich. Wonder 21	25.28	Ave. of constituents	23.61
Mich. Wonder 54	23.76	Continuous mixture	19.44
Mich. Wonder 96	21.84	New mixture	24.24
Mich. Wonder 209	25.56		
Beechwood Hybrid 12	19.68	Ave. of constituents	21.72
Beechwood Hybrid 85	21.84	Continuous mixture	19.56
Beechwood Hybrid 87	23.04	New mixture	22.32
Beechwood Hybrid 207	22.32		
Mich. Wonder 221	21.12	Ave. of constituents	23.34
Kanred	19.08	Continuous mixture	21.00
New York Sel. 123-32	23.52	New mixture	24.96
Red Rock	29.64		
Red Hussar	18.60	Ave. of constituents	21.42
Turkey	24.60	Continuous mixture	18.72
Mich. Amber	23.04	New mixture	22.08
Nigger	19.68		

While the differences between the yields of the mixtures and the average yields of their constituents are all small, they are strikingly consistent. In each case the new mixture is clearly superior to the continuous mixture and is as good or better than the average of the varieties included, while the continuous mixture is in each case clearly inferior in yield to the average of the constituent varieties. This is probably caused by the fact that conditions last year favored varieties which were not high yielders this year. The continuous mixture therefore contained a larger proportion of the poorer varieties for the conditions of this season.

This view is supported by the analysis made of both the continuous and the new mixture crops in Group 4. The four varieties of this group were easily distinguishable and at harvest the heads were separated into four groups which were threshed separately. The average percentage composition of these mixtures is as follows:

Constituent	Continuous mixture		New Mixture	
	Heads	Grain	Heads	Grain
	%	%	%	%
Mich. Wonder 221	29.3	31.6	24.8	26.9
New York 123-32	23.9	22.4	21.9	22.4
Red Rock	22.0	27.9	24.4	29.7
Kanred	24.9	18.1	29.0	20.9

(Nov. 1) The weather during October has been very mild, and fall-sown wheat has made good growth. Thus far we have had no freezing weather and only two light frosts.

During the past season we grew 15 lots of Poole wheat, 15 lots of Red May, and 50 lots of Fulcaster in a comparative yield test to determine the variation in yield which might be expected within a single taxonomic variety. Except in a few cases these strains were not pure-line selections, but were simply pure seed of the variety obtained from different sources. The three highest yielders and the three lowest yielders of each variety are shown below:

Acct. No.	C. I. No.	Variety Name	Yield
		Poole Strains	
W174	5653	Poole (Ohio Station)	29.67
W125		Poole (Ohio Station)	28.13
W181	4894	Harvest King (Ky. Station)	27.98
W178	4805	Nissley (U. S. D. A.)	23.15
W159		Harvest King (West Va. Station)	21.01
W179	5929	Morgage Lifter (U. S. D. A.)	20.12
		Red May Strains	
W210	4864	Michigan Amber (Indiana Station)	31.11
W206	5318	Red Cross (U. S. D. A.)	27.58
W211	4868	Orange (Indiana Station)	25.47
W207	5321	Michigan Wonder (Missouri Station)	22.53
W214	4334	Early Harvest (Ohio Station)	22.20
W212	5324	Pride of Indiana (Missouri Station)	21.84
		Fulcaster Strains	
W294		Fulcaster (Chesterfield, Mo.)	32.00
W18		Fulcaster (Missouri Station)	31.69
W189	5587	Mammoth Red (Arkansas Station)	30.95
W292		Fulcaster (Harrisonville, Mo.)	21.86
W191	5630	Bearded Purple Straw (Tuscumbia Alabama)	21.50
W1426	3387	Dietz (U. S. D. A.)	17.78

Each strain was grown in nine distributed rod rows. The probable error of the mean yields shown above as determined from the Fulcaster check plots was 4.72 per cent in the Poole and Red May tests and 3.69 per cent in the Fulcaster test.

Similar variation was shown in various other features. For example, in the Fulcaster strains the yield of total plant parts varied from 4,558 pounds to 6,854 pounds per acre; the grain-straw ratio varied from 2.09 to 3.33; the weight per thousand grains from 32.182 to 45.159 grams; the average length of head from 7.6 to 10.2 cm.; the average number of fertile spikelets per head from 5.9 to 9.0; the number of sterile spikelets from 1.5 to 2.8.

The strains with the C. I. numbers were obtained from the Office of Cereal Investigations thrcugh the kindness of Dr. Leighty. Other strains in the experiment were obtained direct from various experiment stations and seedsmen, and from growers of approved seed wheat in Missouri.

These results are similar to the results we have previously obtained with Red Rustproof and Kherson oats, in both of which a large variation in yield is found.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (Oct. 24) The harvesting of the hand pollenated ears was completed on October 12. Up to that time we had had a few light frosts but none severe enough to do any damage to the corn.

On the 16th the plot of Four County White Corn at Ackley, Iowa, was harvested and on the 21st a duplicate planting of the same plot here at Ames was harvested. I expect to have completed most of the other harvesting here at Ames by the first of November.

Mr. Bryan, who is cooperating with Mr. Robinson of this Station on the Iowa Corn Yield Contest, started harvesting on October 10 and expects to complete the last field this week.

The weather so far this fall has been ideal for work in the field and has helped considerably in getting all of the harvesting done early.

Iowa State College, Ames (Barberry Eradication, J. H. Muncie) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (Oct. 19) The harvesting of the hand pollinated ears of corn will be completed today. We expect to start harvesting the large inoculation experiment at once.

C. S. Reddy has returned to the University of Wisconsin for the winter. The writer has just returned from a vacation in West Virginia, Pennsylvania, and Ohio.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report).

Purdue University, College of Agriculture (Barberry Eradication, K. E. Beeson) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer) (October report) All but three of the field men, returned to college prior to Oct. 1. One of the remaining three resigned Oct. 10 to accept a position as County Agricultural Agent.

Three islands in Lake Erie, namely, Put-In-Bay, Middle Bass, and North Bass, were surveyed in early October. Nine barberry plantings were found on Put-In-Bay.

One-fourth of Marion County was covered in October by a farm-to-farm survey.

Very little had been accomplished, until recently, toward getting the barberries out of the wealthy residential districts of Toledo. The task was tedious. Approximately 300 barberry plantings have been listed within the city limits.

Resurvey for sprouts was completed in Lucas County during October. Rechecking was also started in Montgomery County.

A barberry eradication bee was held two miles north of Mingo, in Logan County, Oct. 16 and 17. The affair was given publicity by circular letters and newspapers. Unfortunately, unfavorable weather affected the attendance. Rain stopped the procedure on the afternoon of the 16th. The workers' clothes were dampened but it did not affect their determination to finish the job. All barberries found were dug. Approximately 800 bushes, ranging from one to ten feet in height, were destroyed. About 400 sprouts were uprooted. At least 10,000 seedlings were pulled. Large escaped bushes were found two miles from the original planting. A photographer and a reporter were on the job. Two county agents were present. Wonderful chicken dinners were served by women of the neighborhood on both days.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. H. Befdy) (No report).

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, William A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report).

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. T. Melander) (October report) During the month of October, field forces were considerable less than those of the preceding three months. The work was mainly concentrated in Fillmore County as this is a very obstinate area to work. There were sixteen escaped areas, containing 1391 bushes found in this county alone. Goodhue County produced 4202 escaped bushes and Olmsted 2301. These three counties contained our worst problem in escaped bushes.

A barberry demonstration was put on at the National Dairy Show, held from the 7th through the 14th of October. This display attracted considerable attention, in fact, we were kept busier demonstrating at the Dairy Show than we were at the State Fair, this year.

Before winter sets in, we hope to have the survey of Fillmore, Dakota, and Washington Counties completed, which will make a total of 23 counties surveyed this year.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward, (John B. Sieglinger) (Oct. 18) Weather has been cool and dry this month to date. There have been several light frosts which varied considerably with locality. In some places the sorghums were killed while in other places the crops are yet alive and growing or maturing.

Harvesting of the plats and selection of seed heads have been in progress since the last report. The sorghums are fairly well harvested at present; only the later dates and a few of the later varieties remain to be harvested. The broomcorn is all harvested and most of it has been sorted and weighed. The yields obtained this year in the varietal and date-of-seeding experiments are as follows:

Rate of seeding experiment with Acme Broomcorn.

Date of seeding.	Pounds brush per acre.		
	Poor	Good	Total
April 15	54.	255	309
May 2	70	120	190
May 16	37.5	200	237.5
May 31	66.5	275	341.5
June 15	25	475	500.0
July 1	Not dry enough to weigh.		

Varietal experiment.

Variety	C.I. No.			
Standard	556	50	300	350
"	530	50	162.5	212.5
Dwarf	599	28.5	350.0	378.5
"	598	33.3	300.0	333.3
"	597	21.5	435.5	457.0

Varietal experiment.

Variety	C.I.No.	Poor	Good	Total
Dwarf	596	28.5	407.0	435.5
"	595	25.0	450.0	475.0
"	564	50.0	412.5	462.5
"	557	35.7	392.8	428.5
"	535	42.8	428.5	471.3
Acme	243	35.7	392.8	428.5
Thisk dwarf,	442	37.5	300.0	337.5
Dwarf (German)	559	43.8	381.2	425.0

Note: - The broomcorn varietal experiment was seeded on June 5.

The maximum temperature for this period was 91° on Oct. 7, and the minimum, 33° on Oct. 9. The precipitation for October to date has been 0.30 inch in three showers.

(Nov.2) The later part of October continued dry though there were several light showers. There has been no killing frost on the Station to date. Wheat over the county is alive but needs rain. In spite of the previous good crop years there appears to be little rough feed over the County. This lack of feed, together with the present condition of wheat, looks rather unfavorable for stock this winter. Generally wheat can be counted on for a lot of winter pasture, but there must be more rain to make wheat pasture this year.

Everything on the cereal project is harvested and thrashing will start this week. Although the acreage of broomcorn was much greater this year than last the total production will not be so great. The drought of last summer is the cause and also is accountable for the present relatively high price of broomcorn. The average price for broomcorn in this vicinity will be around $200 per ton or slightly higher.

The maximum temperature for the last half of October was 89° on the 27th, while the minimum was 35° on the 18th. The precipitation for this period was 0.37 inch, or a total precipitation for October of but 0.67 inch.

TEXAS

(A. C. Dillman) (Oct.30) Geo. T. Ratliffe, Superintendent, of the San Antonio Experiment Farm, San Antonio, Texas, reports the following yields of flaxseed. Flax is grown as a winter crop at San Antonio and is harvested early in May.

Variety	C.I. No.	Stand % estimated.	Yield, bus. per acre.
N. D. R. 114	13	25	6.5
N. D. R. 52	8	35	6.1
Dament	3	35	5.3
Primost	12	20	3.4
Punjab	20	35	1.0

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker) (September report)

Weather and Crop Conditions in Kansas for September.

Third week: Soaking rains fell in northeastern and parts of south central Kansas which put the ground in find shape for seeding wheat. The western and north central counties were still extremely dry, not having received enough moisture to relieve conditions since the first week of August. Sowing wheat had commenced in the eastern third of the state and from 5 to 50 per cent had been planted in the western counties in spite of the fact that the ground was too dry to support growth.

Fourth week: Temperatures rather near the frost line occurred on one or two mornings but no frost was reported. The north central and western parts of the State were still badly in need of a soaking rain. In the eastern third, ground was generally in excellent condition. Wheat sowing was under way in all parts of the State and from 25 to 50 per cent completed in the northwestern sections. Only about 10 per cent of the winter wheat crop was sown in the south central and southeastern counties where farmers were holding off until the fly-free dates of early October. In the western half of the State much wheat had been sown in ground so dry that any seed which germinates will soon die unless there is rain.

Weather conditions at Manhattan, September.

There was measurable precipitation on 7 days and a total for the month of 4.95 inches; maximum temperature of 107° on 1st, minimum temperature of 43° on 11th.

During the month a large quantity of wheat seed from the nursery was packeted and prepared for planting in the "take-all" experiments at Abilene, Kans., and for the leaf rust and stinking smut nurseries at Manhattan. Seed of the classification nursery was sent to Mankato, Kans., where it will be

grown by John T. Pearson, agricultural instructor in the high school, in cooperation with this department. Several promising varieties and strains from the nursery were also turned over to Professor Salmon for seeding in plots at the Agronomy Farm and were sent to Mr. Bales for planting at the Hays Branch Experiment Station.

Planting of winter wheat in the nursery began September 25 and was completed September 30. There were 3,270 rod rows sown in the replicated rod rows series, 435 single rod rows, and 4,330 head rows,- the largest nursery ever sown at Manhattan. The head rows included about 1600 selections from the Kanred X Federation cross received from the Sherman County Branch Station, Moro, Oreg., and about 1,000 selections from the Kanred X Kota cross received from Davis, Calif. Approximately 175 of the most promising selections from the winter X spring wheat crosses have been sown at Manhattan and Hays, Kans., and at the Akron Field Station, Akron, Colo. It is expected that additional series of this same material will be sown at Lincoln, Nebr., and at Colby, Kans.

Thirty five of the highest yielding selections from these winter x spring crosses have been sent to the Denton (Texas) Substation. About 650 head rows of winter-hardiness crosses were sent to Mandan, N. Dak.

Professor Salmon judged the crop exhibits at the Topeka State Fair and at the Wichita Wheat Show.

College opened on September 13 with an enrollment of about 2,750 students in the four-year courses.

R. I. Throckmorton, Professor of Soils, is spending the year in graduate study at Cornell University. There are two graduate fellows in soils, O. C. Bruce, Professor of Soils in Maryland, University, who is here on the sulfur fellowship provided by the National Research Council, and Mr. McRuer, a graduate of K. S. A. C., who has been in county agent work for several years.

B. B. Bayles returned to Manhattan from Hays October 18. In addition to writing the annual report of the cereal experiments at Hays he will prepare the annual reports of the cereal experiments at Manhattan and assist in the preparation of manuscripts.

E. R. Ausemus, student assistant in crop improvement, will be able to complete about two-thirds of the work toward his Master's degree by the end of summer school in 1923 and will assist in the experiment station work during the College year and next summer.

Messrs. Parker and Bayles visited the Tribune and Garden City experiment stations September 16 and 17. September 18 they visited the farm of Mr. Walter Pierce, at Darlow, who has developed a promising new white-seeded Grain sorghum from a Feterita X Blackhull kafir cross. Head selections were made which will be grown at Hays and Manhattan next year.

Messrs. Parker and Laude, of the Agronomy Department, spent the week of October 3 at the Colby Branch Station taking notes, harvesting, and classifying the ears from the ear-to-row breeding project with Colby Blocay Butcher corn. Although all of the work to date has been with open pollinated material, it is felt that real prigress is being made in the isolation of distinct types with respect to size of cap, color of endosperm, and different shades of the red pericarp colors. An interesting weak strain also has been isolated and a dwarf type resembling the "anther-ear" type previously isolated from other varieties by various plant breeders. There seem to be worth while differences in smut resistance, and observable and measurable, though not extremely marked differences, with respect to the effects of root rot in the rows planted from ears having good and poor germinator records. A number of self pollinations were made in connection with this project this year and it is expected that about 75 rows will be grown next year from selfed ears.

Hays Branch Experiment Station, Hays (B. B. Bayles) (No report)

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (October report) The month of October at Akron has been extremely dry. The total precipitation for September was but 0.06 inch and for October only 0.05 inch. This is the record fall drought in this section. The weather as might be expected with such moisture conditions is mild and the days bright; there have been few cloudy days. During the latter part of the month several heavy frosts and light freezes were recorded.

With such moisture conditions, following a droughty cropping season the soil is extremely dry and no plant growth is possible. Winter wheat sown in August had emerged to about a half stand. At the present time few if any plants are to be found on these plats. None of the wheat sown since August has emerged and as absolutely no moisture is in prospect it is difficult to predict the condition of the winter wheat crop in this section or to imagine what the coming harvest will be. Even if moisture were received within the next few days the winter wheat would not emerge until some time late in the winter or early in the spring.

Considerable anxiety is being expressed in this section as it appears that the so called false wire worm is present in many fields. It is difficult to estimate the amount of damage that this pest is doing as the wheat has not emerged. If the amount of damage could be ascertained it might not be too late yet to reseed the fields and obtain some kind of a crop next season. Fair yields have been obtained at Akron from seedings of winter wheat made in November. Although the different cereal plats have been examined rather carefully, no damaged kernels of wheat nor any of the worms have been discovered by the writer.

The field work at Akron has been completed during the past month. The yields on several of the corn varieties and selections were very good for this section. Some of the better plats and rows yielded as much as 35 to 40 bushels. Sorghum threshing was completed during the month. Our better yielding sorghum selections threshed about 40 bushels of grain to the acre, these being the highest sorghum yields ever obtained at this station.

During the past week the time has been spent in writing the annual report. The report is now more than three-fourths completed.

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren for John R. Fitzsimmons) (No report)

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton) (Oct. 27) During the month of October the original survey of Sully, Hughes and Charles Mix Counties was completed. A total of only 95 new bushes was added to the state total this month. Fifty-seven man days were used in original survey and 168 in resurvey. The completion of the counties named finished the original survey east of the Missour river and an attempt is being made to clean up the surveyed counties before winter. Twelve and one-fourth counties were resurveyed this month without a single county being found absolutely clean of barberry sprouts. The following data was compiled from the resurvey reports that reached this office before October 25.

County	Properties resurveyed	Properties with sprouts	Properties clean	Percent properties with sprouts.	Year of original survey.
Bon Homme	27	8	19	30	1922
Clark	7	2	5	28	1921
Day	17	1	16	6	1919-20
Deuel	4	1	3	25	1919-20
Hanson	9	3	6	33	1922
Hamlin	5	2	3	40	1920
Lake	28	10	18	36	1919-20
McCook	11	4	7	36	1921
Miner	9	2	7	29	1921
Sanborn	12	2	10	16	1922

All of the sprouts found in the above conties were dug, but the places found sprouting must be revisited. An interesting sprout study was made during Dr. Kempton's visit in the state. The farm of Nick Kirsch, Elmira Township, Codington County had barberry bushes on it on Sept. 1, 1921. These bushes were dug at that time. In June 1922 a resurvey was made of the place and no sprouts were visible. Mrs. Kirsch looked for sprouts in August 1922 and found none. Yet on another revisit, September 3rd, 1922, sprouts not over one week old were found. It had taken these sprouts just one year to come to light.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. F. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Mayoue) (September report) Very good progress has been made in the farm-to-farm survey during the month of September. The survey was conducted in Emmons, Grant, Sioux, Burleigh, Morton, Kidder and Ward counties. Most of the time was spent in the last four counties named.

The assistants working in Emmons County found a planting across the line in Logan county.

One field assistant resurveyed in Fargo. He found 286 sprouts on 76 properties which had been eradicated in 1918 and 1919. Resurvey was also conducted in the rural districts of Cass county. In this survey 100 sprouts on 12 properties were found. A total of 44 bushes on six properties were found for the first time in this resurvey.

Demonstrations have been made at the Stark County Fair at Dickinson and the Ward County Fair at Minot. Live bushes which had been located in these counties were shown in the demonstrations, which attracted a great deal of attention, and much interest was shown by the people.

Twelve field assistants stopped work September 30 and resumed their college studies.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (Nov. 2) During the month of October the weather was very mild and favorable for outdoor work. For the first half of October maximum temperature was 90° on the 1st and 3d; minimum, 19°, October 11; precipitation, trace. For the last half of the month the maximum temperature was 77°, October 27; minimum, 18°, October 16; precipitation, 0.64 inch.

The moisture requirement work was completed with the harvesting of the flax October 5. The flax nursery rows remaining in the field were harvested October 7. Most of the time during October was taken up with notes and threshing of flax hybrids and selections. This work was completed October 31.

Professor N. M. Tulaikov, President of the Russian State Institution of Agronomy in Petrograd, visited the station November 1.

Dickinson Substation, Dickinson (Ralph W. Smith) (Oct.19)
Today I finished threshing up the flax and proso varieties and below you will find the yields of the proses. I did not report the yields before as the amount of chaff, etc., left in them at thrashing made it necessary to clean them to get accurate yields.

I hope to come in to Washington some time next month.

Flax yields from triplicated 1/56 acre plats.

C.I.No.	Variety	Yield (bu.per.acre)	C.I.No.	Variety	Yield (bu.per acre)
184	Sel.C.I. 26-27	19.6	186	Sel. C.I. 19-6	14.8
185	Sel.C.I. 17-12	19.6	12	Primost	14.7
19	Reserve	18.3	15	N.D.R. 114	14.4
14	N.D.R. 75	16.3	183	Sel.C.I. 30-23	13.8
3	Dakent	15.5	260	Sel.C.I. 4-1	13.6
8	N.D.R. 52	15.1			

Yields of proso from duplicate 1/56 acre plats.

23	Early Fortune	22.9	101	Yellow Manitoba	15.5
61	Red Russian	21.9	31	Turghai	12.1
4	White Ural	20.9	27	Black Voronezh	11.5*
19	Gray Sarepta	16.1			

* Yield reduced by smut.

(Oct. 31) The first snowfall of importance for this season occurred yesterday. About 5 inches of snow fell, making 0.42 inch of precipitation. Most of the snow disappeared today. This was practically the only precipitation for the month, except for a few light showers and a little snow on October 15.

Thrashing is practically finished in this county. Fortunately the fall weather has been unusually favorable for thrashing, as the amount to be done was much larger than usual and there were not sufficient machines to thrash the crop during the ordinary thrashing season.

Little fall plowing has been done this season due to the very dry condition of the soil and little fall seeding for the same reason.

The varieties of wheat, oats, flax, and proso have been cleaned and samples of wheat are being prepared for milling.

Winter wheat and rye have been weakened by the dry weather but will be benefited by the melting snow.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May) (Oct. 26) This has been a very dry fall. The precipitation during October was 0.43 inch, during September 0.71 inch, and during August 0.43 inch, a total of 1.67 inches in the three months. Temperatures have been above average. We did not have any freezing weather during September and have had only six days during October upon which the temperature fell below freezing. The lowest of these temperatures were 12 and 16 degrees on October 15 and 16 respectively. The first frost occurred on October 6 with a temperature of 28 degrees.

The fall was very so dry that wheat sown about the middle of September has not half emerged (Oct.20) This statement applies throughout the Judith Basin, although a few fields which were sown extremely early have fully emerged and appear to be vigorous.

The Montana Experiment Station is building a small dairy barn here. The building is 30 X 40 feet with a hay mow above. The structure is almost half completed. Work connected with the building has delayed the storing of the 1922 crop.

Following are preliminary records on some of the experiments with wheat at Moccasin in 1922. Further checking may result in some slight changes in these figures.

Sixteen fiftieth acre plats were sown with the furrow drill for this experiment. The following spring two plats were harrowed once lengthwise when the plants were 4 or 5 inches high, the next two were left unharrowed, then two harrowed, and so on. The average yield of the eight harrowed plats was 46.6 bushels, and of the unharrowed plats, 46.5 bushels.

A furrow-drilled field could not be harrowed crosswise, as this would cover the wheat when the ridges stand as high as they did this spring. The almost continuous covering of snow last winter protected the ridges, causing them to retain nearly their original height.

Furrow Drill Rate-and-Direction-of-Seeding Experiment.

Rate of Seeding per Acre.	Furrow Drill Yield (Bus.)	Ordinary Drill Yield (Bus.)
	North and South Direction	
2 pecks	37.6	29.9
3 pecks	38.1	33.7
4 pecks	37.6	34.1
5 pecks	37.6	35.7
Average	37.5	33.4
	East and West Direction	
2 pecks	36.0	26.8
3 pecks	37.9	29.4
4 pecks	37.1	30.7
5 pecks	38.6	33.6
Average	37.2	30.0
Grand Average	37.5	31.7

No straw mulch was used in this experiment and here the furrow drill outyielded the ordinary drill by almost 6 bushels per acre. It is interesting to know that this test was conducted on the same land this season as in 1920, but with the location of the plats north and south drills was reversed. In 1920 the plats sown with the furrow drill outyielded those sown with the ordinary drill by about 6 bushels to the acre and in 1921 by about 9.5 bushels.

Straw-mulch Experiment.

Straw mulch	Furrow Drill Yield	Ordinary Drill Yield
No Straw	33.1	30.3
1/4 Ton	31.5	31.9
1/2 Ton	33.4	34.6
1 Ton	32.3	35.7
2 Ton	31.3	35.3
3 Ton	31.1	36.7
Average	32.0	34.1

The wind blew the straw so badly that the plats intended to receive no straw actually received in many instances as much as or more than any of the other plats. The straw was spread on top of a snow, but after the snow melted and the straw dried a large part of the straw blew away. On the furrow-drill plats, particularly, some of the straw blew into drifts. Just as soon as the snow melted in the spring these straw drifts were scattered but the wheat on these spots was either already smothered or the plants were so weak that they later died, leaving the spots practically bare. The furrow-drill plats caught many more and larger straw drifts than the ordinary drill plats because of the ridges. The almost continuous covering of snow during the winter and early spring gave added weight to the straw drifts.

The straw mulch produced a very distinct injury to the wheat in the furrow drill plats of the straw-mulch experiment this season. The straw mulch has not been of any appreciable benefit to the wheat sown with the furrow drill in any of the three years the experiment has been conducted (in some instances it has caused distinct injury) while on the other hand the straw mulch has always shown a fairly distinct benefit to the wheat sown with the ordinary drill. This is shown by comparison with the unmulched plats sown at the same rate, 4 pecks per acre.

Winter Wheat Varieties.

Variety	C.I.No.	Yield (Bu.per A.)	Variety	C.I.No.	Yield (Bu.per A.)
Kharkof	1583	35.9	Kharkof (Check)	1583	40.1
Harmont	6700	35.0	Kharkof (parent)	1442-1	39.2
Kharkof (Mont 36)	5049	35.7	Newton (C.I.5300) X Turkey		
Kanred	5148	33.4	(C.I.No.1568 163 B 1-6		41.1
Turkey	1568	35.6	Do B 1-8		42.5
Minturki	6155	32.4	Do B 9-5		39.2
Minhardi	5149	33.4	Do B 10-6		41.7
Buffum No.17	3330	32.6	Do B 14-2		39.6
Wis. Ped. No. 11-825	6680	29.9	Kharkof (C.I.No.1442-15 X Newton (C.I.No.5300) 163 D. 2-7		38.3
Blackhull	6251	29.3	Kanred X Marquis (bulk seed)		35.0

All varieties listed in the right-hand column were tested in single plats only.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report)

WESTERN BASIN AND COAST AREAS ([illegible])

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (October report)
The months of September and October in Eastern Oregon were considerably drier than normal. The total rainfall at the Station at Moro for September was only .42 inch, not enough to make the moisture meet in the summer-fallow and insure germination of winter wheat. During the first week in October, there were showers over most of Eastern Oregon which made conditions favorable in some localities for the planting of winter wheat. At Moro between the 2nd and 5th, we had .71 inch rainfall with warm weather for the three weeks following.

Winter wheat planted during the latter part of August did not emerge until a week after this rain. In most sections of Sherman County farmers have sown their winter wheat and secured good stands. There are a few places in this county, however, and also in other Eastern Oregon counties where winter wheat sown three or four weeks ago has not yet emerged on account of insufficient soil moisture. All winter wheat on the Station has been planted and practically everything, including the nursery, has emerged with good uniform stands.

No frost has yet been recorded up to date.

CALIFORNIA

Butte Rice Field Station, Biggs (G. N. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (Fred N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Personnel (Nov.11-20) and Field Station(Nov.1-15) Issue.

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PERSONNEL ITEMS.

Emil V. Ahlness, field assistant in barberry eradication in North Dakota, since July 1, 1922, finished his field duties October 31 and his appointment was terminated on that date.

Miss Lois Atkins, clerk in the cereal-disease investigations conducted in cooperation with the California Agricultural Experiment Station at Berkeley, Calif., resigned October 31, 1922, because obliged to leave Berkeley.

Dr. Carleton R. Ball, cerealist in charge, attended the second annual meeting of the Conference for the Prevention of Grain Rust at Minneapolis November 14. The meeting was very successful. Delegates from every one of the 13 States covered by the barberry eradication campaign were present and all of them deeply interested in and intelligent on the subject. In the absence of Governor Preuss, of Minnesota, Governor Nestos, of North Dakota, was the presiding officer. All sessions of the Conference were carried forward in a most business like way. One of the interesting features was the presentation of a movie reel depicting the destruction caused by stem rust, the problems of barberry eradication, and the breeding of rust-resistant varieties of wheat.

The poll of the delegates on the question of working for State appropriations was unanimous in favor of the concerted and vigorous action to supplement Federal funds by funds from the various States. The work of the executive committee during the past year was approved, the plans for the coming year were presented and met with hearty approval, and every evidence was given that the Conference is performing effectively the work for which it was organized and has a bfoad grasp and a clear vision of the procedure necessary to ultimate success.

Walter D. Bowers, field assistant in barberry eradication, with headquarters at Lincoln, Nebr., resigned November 4 upon the completion of his field duties.

J. C. Brinsmade, Jr., assistant agronomist, in charge of the flax experiments at the Northern Great Plains Field Station, Mandan, N. Dak., left Mandan November 16 for Washington, D. C., stopping en route at Fargo, N. Dak., to confer with officials of the agricultural experiment station. While in Washington Mr. Brinsmade will write a report of the flax experiments conducted during the past year and confer with the cerealist and others regarding agronomic and genetic studies of flax.

Ernest L. [illegible], agronomist, who has been engaged in the investigation of corn improvement in the Great Plains area, resigned his position November 15 to engage in private work.

Jonas J. Christensen, agent of this Office engaged on studies of stem rust epidemiology in cooperation with the Minnesota Agricultural Experiment Station, was granted permission November 9 to pursue post-graduate study at the University of Minnesota during the current college year, looking toward the degree of Master of Science. The course of study will include plant pathology, cytology, research in mycology, and plant breeding and physiology.

E. L. Coffman, assistant agronomist in charge of cereal experiments at the Akron Field Station, Akron, Colo., arrived in Washington, D. C., November 20. Mr. Coffman will prepare a report of the experiments of the past year and a manuscript for a proposed bulletin on the results obtained at the Akron Field Station.

A. C. Dillman, agronomist in charge of flax investigations, on November 16 addressed the 35th annual convention of the National Paint, Oil and Varnish Association, held at the Ritz-Carlton Hotel, Atlantic City November 15 to 17, inclusive. Mr. C. T. Nolan, Chairman of the Flax Development Committee, of New York, introduced Mr. Dillman, whose subject was "Flax and Wheat, A Combination Crop," illustrated by lantern slides. This mixed crop has been grown for 10 or 15 years in the vicinity of Red Wing, Minn., and its culture has become an established farm practice in Goodhue County. During the past summer several agronomists from State experiment stations in the flaxseed-producing area visited Red Wing at the invitation of the Red Wing Linseed Oil Company and all were impressed with the extensive sowing of the mixed crop and its apparent success.

Joseph S. Fairchild and John F. Holmes, field assistants in barberry eradication in South Dakota since July 1, 1942, completed their field duties October 31, on which date the appointments were terminated.

Miss Helen Johnson, assistant plant pathologist in cooperative investigation of imperfect and sac fungi at the Wisconsin Agricultural Experiment Station, was granted permission November 9 to pursue post-graduate study at the University of Wisconsin during the present college year. The course will include microchemistry and plant pathology.

Edmund B. Lambert, agent of this Office, engaged on cooperative studies of stem rust epidemiology at the Minnesota Agricultural Experiment Station was granted permission November 9 to pursue post-graduate study in plant pathology, cytology, mycology, and plant breeding at the University of Minnesota, looking toward the degree of Master of Science.

M. N. Levine, assistant pathologist in stem-rust investigations conducted in cooperation with the Minnesota Agricultural Experiment Station, arrived in Washington November 20 to conduct special greenhouse studies on biologic forms of stem rust and to confer with project leaders relating to his investigations.

H. H. Love and W. T. Craig, of the Department of Plant Breeding, at Cornell University Agricultural Experiment Station, Ithaca, N. Y. and collaborator and agent, respectively, of this Office, arrived in Washington November 20 to confer with project leaders concerning future plans for the cereal experiments conducted in cooperation with this Office.

H. H. McKinney, assistant pathologist in charge of the sub-project covering investigation of take-all and foot-rot diseases, in cooperation with the Wisconsin Agricultural Experiment Station, was granted permission November 9 to pursue post-graduate study at the University of Wisconsin, looking toward the degree of Doctor of Philosophy. The course will include botany, plant cytology, microchemistry, and German.

Leo D. Miller and Frank B. Tucker, field assistants in barberry eradication, with headquarters at La Fayette, Ind., resigned November 1 and 7, respectively, and returned to farming.

John H. Parker, agent, arrived in Washington November 15 and will spend some time in the preparation of manuscripts on the results of cereal-disease and agronomic experiments conducted in cooperation with the Kansas Agricultural Experiment Station at Manhattan, Kans. En route to Washington Mr. Parker conferred with agronomists and pathologists at Chicago, Ill., and Morgantown, West Va., regarding research problems.

John T. Pearson, field assistant in barberry eradication in Kansas since May 15, 1922, completed his duties November 14, on which date the appointment was terminated.

Frederick W. Roewekamp, field assistant in barberry eradication in Wisconsin since July 1, 1922, resigned October 31, to accept a position in California.

Ralph W. Smith, assistant agronomist in charge of the cooperative cereal experiments at the Dickinson Substation, Dickinson, N. Dak., arrived in Washington November 20 after conferences with experiment station officials at Mandan and Fargo, N. Dak. and St. Paul, Minn. In Washington he will spend some time in the preparation of a report on the past season's investigation and a manuscript for a bulletin on the results obtained at the Dickinson Substation.

Frederick J. Stevenson, agent in cereal investigations in cooperation with the Washington State Agricultural Experiment Station, Pullman, Wash., resigned September 15 to accept a position as instructor in agriculture and supervisor of practice teaching at the Washington State College.

Steve J. Timboricus, field assistant in barberry eradication with headquarters at Ames, Ia., completed his field duties November 2, on which date the appointment was terminated.

Robert W. Webb, assistant pathologist in the investigation of take-all and foot-rot diseases of wheat in cooperation with the Wisconsin Agricultural Experiment Station, was granted permission November 9 to pursue post-graduate study at the University of Wisconsin during the current college year. Mr. Webb's course of study will include botany, plant cytology, and microchemistry.

Miss Grace C. Cleveland, assistant pathologist in cooperative investigation of imperfect and sac fungi at the Wisconsin Agricultural Experiment Station, was granted permission November 3 to pursue post-graduate study at the University of Wisconsin, looking toward the degree of Doctor of Philosophy. The course of study includes chemistry, microchemistry, and plant pathology.

VISITORS

Edward C. Johnson, dean of the State College of Agriculture, and director of the Washington Agricultural Experiment Station, Pullman, Wash., called at the Office November 20.

Karl S. Quisenberry, assistant agronomist at the West Virginia Agricultural Experiment Station, was an Office visitor November 17.

MANUSCRIPTS AND PUBLICATIONS.

A paper entitled "Flax and Wheat - A Combination Crop," by A. C. Dillman, agronomist in charge of flax investigations, was approved Nov. 14 for publication in the Oil, Paint, and Drug Reporter, without compensation to the author.

Page proof of Farmers' Bulletin 1305, entitled "The Soft Red Winter Wheats", by C. E. Leighty and J. H. Martin, was read November 17.

U. S. Department of Agriculture Circular 203, entitled "Trebi Barley: A Superior Variety for Irrigated Land," by Harry V. Harlan, Merrill M. Pope, and Louis C. Aicher was received November 13.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs) (Nov.9). Seeding at the Coastal Plain Experiment Station was completed November 3 with the soil in excellent condition.

All grains at Athens are up and growing nicely, with the exception of a few plats on which germination was poor.

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hammerly) (No report).

VIRGINIA

Arlington Farm, Rosslyn (J. T. Taylor) (No report)

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

MISSOURI

Agricultural Experiment Station, Ames (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (No report)

Iowa State College, Ames (Barberry Eradication; J. H. Muncie)(No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (Nov. 15) Unusually satisfactory progress has been made in the harvesting program. Yesterday forenoon we finished shelling all our corn; in the afternoon all of the samples were shipped to Urbana for moisture determinations and the results probably will be returned to us the latter part of next week. Mr. Koehler and I expect to spend most of next week harvesting the experiments in Knox County. The week of November 20 will be spent in completing this year's yield data, which is the earliest date we have ever been able to complete yield data.

State Entomology Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

Purdue University, College of Agriculture (Barberry Eradication, K. E. Beeson) (October report) Two teams were engaged in original survey during October. The survey of Rush County was completed and some work done in adjoining counties. Rush County revealed one rather large area in the southwestern part that was generally rusted, but an escaped planting southwest of this area accounted for the rust. A number of local cases, were reported, in each of which the damage was severest on the grain nearest the bush. In a few fields ruined grain was still standing at the time of the survey.

One team is continuing in the field, rechecking in counties previously surveyed.

Experimental plats for overwintering studies have been established at 5 different places in the State and inoculations have been made. At Lafayette experiments are under way to determine the effect of mulching with straw and leaves upon the vitality of uredinicspores. Another series is being run in the greenhouse and in the field to obtain information as to the effect of field conditions on length of inoculation period and development of rust.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John T. Baringer) (Nov.15) On November 1 and 2 two tons of crystal rock salt were used in treating escaped barberry bushes on the property of The France Stone Company near Holland, Lucas Co., Ohio. The salt was applied in various quantities to barberries ranging in size from seedlings to bushes 10 feet tall and having from 1 to 40 stems.

In August about 300 large barberry bushes, on the same property, were treated with a dilute solution of sodium arsenite. All bushes that received applications of the arsenical salt are apparently dead. The grass for a radial distance of from one to two feet from the bases of the treated bushes is also dead.

One field man was kept busy during the first half of November attempting to induce Toledo property owners to part with their barberry bushes. A second scout has checked a hundred country locations in Montgomery County, for sprouts and has spent several days searching the woods near West Carrollton for stray escaped barberries.

During the past two weeks one half of Marion County has been covered by a farm-to-farm survey for barberries. The rural survey has been started in Seneca County. The roads are in good condition and the weather is excellent for this type of field work.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, William A. Walker) (October report) The scouting force has been cut down to three men, the remainder having returned to their respective schools.

The survey of Columbia County has been completed. One newly escaped area was found consisting of about 80 bushes. Dodge County has just been finished. We expected to finish earlier, but the locating of four areas in the last section to be scouted slowed up the work. The areas varied from 100 to 300 bushes. Barberry plantings were found quite uniformily in Dodge and Waukesha Counties. The scouting of the latter has been the slowest because of the large number of lakes surrounded by cottages, which makes considerable foot work necessary. All three scouts are now working in Dane County.

The weather has been favorable up to the past week; the barberry bushes have retained their foliage and it has been easy to distinguish them.

Two escaped areas have been treated in the last few days, one in Richland County, with sodium arsenite by Mr. Thompson, Mr. Hill, and the State leader, the other at Marshall where bushes on two farms were treated with salt. Arrangements have been made to treat the area at Lodi in Columbia County, also the escaped areas in the southeastern part of Dodge County,

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E.C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger) (November 4) A number of showers during the first part of this month have benefited wheat a great deal. Some of the sorghum plats have been thrashed and fanned, and results have been figured.

The yields of grain sorghums which have been thrashed to date are as follows:

Varietal Experiments, Seeded June 2, 1922.

Variety	C.I.No.	Yield Bushels per Acre.
Dwarf White milo	627	19.52
Feterita	182	23.27
Feterita hybrid	182-H	21.92
Spur feterita	623	17.06
Blackhull kaoliang,	310	20.94
Std. Bkhl. kafir	71	15.64
Reed kafir	620	19.37
Dawn kafir	340	12.75
Sunrise kafir, Dwf.	472-Dwf.	13.12
Sunrise kafir Plat 1	472	14.25*
Sunrise kafir Plat 2	472	11.62**
Sunrise kafir Plat 3	472	10.50***
White African kafir	566	10.68
White kafir	370	7.50
Pink kafir	432	10.87

* Select heads open pollinated head to row.
** Bulk seed for several generations.
*** Bagged heads for several generations.

Rate-of-seeding experiments with kafir, Seeded May 11.

Rate Plants	Yield bushels per Acre. Sunrise kafir	Reed kafir
6 inches apart	10.35	19.35
12 inches apart	12.00	20.78
18 inches apart	12.42	18.85
24 inches apart	12.21	18.21
30 inches apart	14.14	1[illegible].84

Date-of-rate

Date-of-seeding Experiments:

Date seeded	Yield bushels per acre. Sunrise kafir	Dawn kafir	Reed kafir	Feterita	Blackhull kaoliang.
April 15	8.06				
May 2	4.00	3.75	8.25	5.43	5.69
May 15	6.05	7.00	14.00	[illegible]	[illegible]
May 31	10.50	10.50	18.90	15.1[illegible]	16.81
June 15	11.50	17.00	24.25	27.41	22.24
July 1	Not thrashed	Not seeded this date		18.87	Not thrashed

The remainder of the grain sorghums will be thrashed as soon as conditions permit. - - Maximum temperature for first part of November, 75° on the 3rd and 11th; minimum, [illegible]° on the 14th; first killing frost (25°), November 13th. The precipitation recorded for November to date is 1.03 inches, which fell in four showers.

KANSAS

Agricultural Experiment Station, Manhattan (B. B. Bayles for John H. Parker) (October report) Maximum temperature, 92° October 6; minimum temperature, 26° October 17. The first killing frost occurred October 9. There was a measurable precipitation of five days making a total of 2.14 inches.

Weather and Crop Conditions for Kansas during October.

Week ending October 3. Mild weather prevailed; there was not enough rain to be of any benefit except in some of the eastern and south-central counties. Very few of the north-central and western counties have had a soaking rain since July and the soil there has become quite dry. Wheat seeding is general and on the average from 50 to 75 per cent finished, but there are some localities where it has scarcely started and others where 90 per cent of it is done. The ground is much too dry for it except in the eastern and south-central counties, where conditions generally are good to excellent. It is coming up slowly in the western half of the State because of lack of moisture for germination, but stands so far look good although they must have moisture soon. In the eastern part, especially the Kaw Valley, where seeding began later than farther west, wheat is just beginning to come through and is looking fine. Stands of rye also are quite satisfactory in that section.

Week ending October 10. Temperatures almost up to the midsummer normal prevailed over Kansas during the early part of this week, with a decided change the latter part that brought a light freeze to the southwest counties and light to heavy frosts over the eastern half of the State. There was no damage because of the low temperatures as nearly all important crops had matured. Rains were conspicuous by their absence, except in the eastern third where from a quarter to half an inch fell in many places. The central and western counties are still very dry, many of them not having had a soaking rain for more than two months.

Wheat sowing has made rapid progress, especially in the eastern counties, and is now from 75 to 90 per cent finished in most sections. A great deal of it is up with fine stands from the Kaw Valley south to the Oklahoma line and along the Missouri River in the northeast corner of the State, but generally over the central and western parts the soil is much too dry and a great deal of the seed lies in the ground for several weeks without sprouting. Prospects of using it for fall pastures in the western half of the State are poor at present. Grasshoppers are doing some damage in a few of the western counties.

Week ending October 17. Splendid rains fell in north-eastern Kansas this week and as far southwest as Ellsworth and McPherson Counties, but the western half is still very dry, except in a few scattered localities. Temperatures for the week averaged slightly below normal, with light to heavy frosts several mornings and a killing frost or hard freeze over the northern half of the State on the 17th. In the northwest counties temperatures as low as 22° were reported

Wheat in the eastern counties has nearly all been sown and the greater part of it, especially in the east central portion and the Kaw Valley, is up with fine stands. In the western third of the State seeding has been held back because of the extremely dry weather. Only about 75 per cent of the crop is in the ground and not much has come up yet. Worms are causing great damage to ungerminated wheat in many western counties and much will have to be resown. Grasshoppers are also causing considerable damage in this section of the State. Some wheat is being pastured in the southern half as far west as Dodge City. No damage of importance was done by the low temperatures of the week as most crops had matured.

Week ending October 24. The first freeze and killing frost of the season occurred in all parts of Kansas, except the south-central counties, on the 17th and 18th, with temperatures as low as 13° to 20° in the north-central and northwest sections and down to 25° in the extreme southeast. This was followed by typical Indian summer weather until Saturday night, when light to moderately heavy rains fell in the eastern half of the State. The western half continues exceedingly dry, even for that section.

Sowing wheat is about done, except in the western counties, where it has been delayed in the hope of rain, and some counties report not more than half the crop in. Stands in the eastern half are generally good and especially fine in the Kaw Valley, but in the north-central and western counties what little is up is in a precarious condition and needs rain badly. The false wire worm is doing a great deal of damage to ungerminated seed in this section. Only a few localities report that wheat is furnishing pasture.

Week ending October 31. An exceedingly fine brand of Indian summer weather prevailed over Kansas this week, with some of the highest temperatures ever recorded so late in the season on the 27th and 28th when thermometer readings were close to 90° in many places. Soaking rains fell on the 30th and 31st in many of the central counties, where they were badly needed, and lighter rains in the northeast counties, but the western third remains entirely too dry for crop growth. A severe freeze occurred in the extreme northwest counties on the morning of the 31st.

Wheat is making satisfactory growth in the eastern third of the State, especially the Kaw Valley, and also in some of the south-central counties, but elsewhere only a small percentage has come up and stands are spotted and turning yellow. Much that is up in the dry sections is dying. The rains in the central counties at the close of the week put the ground in good shape to start wheat growing again. The crop is reported to be stooling in most of the eastern counties and in limited localities as far southwest as Ford County. The condition of rye corresponds closely to that of wheat, being good in the eastern half and poor in the western, where not much of it is up yet. Threshing grain sorghums is under way in many places.

John H. Parker left Manhattan November 7 for Washington, D. C., where he will spend part of the winter writing manuscripts for publication. On his way to Washington Mr. Parker intends to spend a few days with Karl S. Quisenberry at Morgantown, West Va., but will arrive in Washington in time for the agronomy meetings. Mr. Quisenberry was formerly connected with the Cereal Office and was stationed at Manhattan.

The winter-wheat nursery at this station is in very good condition, as is also the wheat on farms in this section of the State.

The following table gives the yields of oat varieties grown on the agronomy farm at Manhattan in 1922.

C.I.No.	Kans. No.	Variety	Bu. to the Acre.
839	5179	Kanota	59.7
727	5315	Burt X Sixty Day (Hays)	54.7
1925	6084	Fulghum	54.7
293	5020	Burt	48.1
1912	5181	Fulghum	47.7
1915	5085	Red Texas	47.7
- -	5015	Red Texas	43.4
831	5206	Aurora	41.9
729	5208	Albion	40.9
- -	6021	Kherson	40.7
- -	5009	Kherson	40.3
787	5209	Richland	40.0
1917	5211	Burt	40.0
1919	6052	Burt	38.8
1209	5034	Kherson	37.6
286	5105	Red Algerian	36.1

Hays Branch Experiment Station, Hays (B. B. Bayles) (Nov. 13) The following table gives the grain yields of the sorghums on the cereal project at Hays for the season 1922. It will be noticed that the milo and feterita varieties gave better yields this year than the kafir and later maturing varieties.

Grain Yields of Sorghum Varieties at Hays, 1922.

Variety	C.I. No.	Bu.per acre	Variety	C.I. No.	Bu.per acre.
Dwarf Yellow Milo		38.22	Manchu Brown Kaoliang	171	30.63
Dwarf Yellow Milo	352	36.77	Feterita	182-2	29.91
Early White Milo	480	35.43	Feterita	182	29.65
Standard Yellow Milo	234	31.75	Dwarf Shantung Kaoliang	293	29.79
Dwarf Yellow Milo	184	34.65	Feterita	182-1	28.35
Freed Sorgo		30.85	Dwarf White Milo (P.C.I.No. 3849		28.40

Variety	C.I.: No.	Bu. per acre.	Variety	C.I.: No.	Bu. per acre.
Leoti Dwarf Kafir		27.82	Pink Kafir	451	19.76
White Yolo		27.56	Dawn Kafir	340	19.64
Bonita sorghum		26.67	Dwarf Feterita No.2		19.47
White Kafir	314	25.44	Feterita X Red Amber Sel.No.2		19.25
Dwarf Hegari		25.16	Kaferita		19.19
White Kafir	342	25.83	Tricker Sorgo		19.75
Standard White Milo	352	25.82	White Durra*		18.41
Hussarita		23.71	Barchett Kholiana		18.02
Early Pink Kafir(F.C.I. No.9039		22.99	Standard Blackhull	204	16.12
Red Kafir (F.C.I.No.028020		22.82	Standard Blackhull	71	16.01
Feterita X Red Amber Sel.No.1		22.54	Dwarf Kafir(F.C.I.No.9075)		15.68
Early Buff Durra		22.43	Lubbock Blackhull Texas No.153		15.29
Dwarf Feterita No. 1		21.59	Sweet Dawn Kafir		14.50
Bishop Blackhull Kafir		21.42	Sudan corn		14.06
Darso		20.76	Progressive Kafir**	623	13.22
Min's Dwarf Grainmaker		20.70	Sunrise Kafir	460	12.94
Spur Feterita	633	19.97	Shrock		10.54
			Red Kafir	34	9.76
			Shallu		8.65
* Only one replication.			Red Amber***		21.75
** Very poor stand			Colby Bloody Butcher Corn (Shelled)		21.26
*** Yield based on 50 lbs. per bushel.					

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman) (Nov. 6) Winter wheat prospects have improved very much since I last wrote. A storm, starting with rain November 4, turned to a regular blizzard that night and the ground was covered with snow the morning of November 5. During that day most of the snow melted and today, November 6, the weather is bright and comparatively warm. Probably more than an inch of moisture has fallen, and the cultivated fields are soaked to a depth of 6 to 8 inches. If favorable conditions continue winter wheat probably will be up by November 12 to 15.

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren for John R. Fitzsimmons) (No report)

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson) (No report)

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Geo. C. Hayoue) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lyon D. Waller) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College, (T. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, Geo. C. Haycue) (No report)

Northern Great Plains Field Station, Mandan (J. C. Driesmans, Jr.) (No report)

Dickinson Substation, Dickinson (Ralph T. Smith) (No report)

MONTANA

Judith Basin Substation, Moccasin (Ralph T. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, T. M. Christopher) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (Nov.7) We completed thrashing and warehousing the Station rice November 4. I haven't had time to study the yields, but they ranged from poor to excellent, depending upon seed-bed preparation, stands, and method of irrigation.

We finished thrashing just in time, for from 8 a.m., November 6, to 8 a.m. November 7, 1.30 inches of rain were recorded at the Station. It is not raining today but the sky looks threatening.

Much of the commercial crop is still unthrashed, although just what percentage of the total acreage I am unable to say.

Maximum temperature for October, 89 degrees F., October 1, minimum, 34 degrees F., October 30; total precipitation for the month, 1.25 inches; total evaporation, 2.54 inches.

(Nov.11) We had about 4.75 inches of rain this week, but the weather is now clear. With continued good weather the damage to the rice crop will be negligible. Harvesting and threshing will be more expensive, however, than before the rains.

It is estimated that about 50 per cent of the crop is in the warehouses and most of the remainder is cut and shocked.

University Farm, Davis (W. W. Florell)(No report)

Agricultural Experiment Station, Berkeley (Fred H. Griggs)(No report)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 November 30, 1922 No. 29
Personnel (Nov. 21-30) and Project Issue.

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DATE OF ISSUANCE OF CEREAL COURIER

Beginning with this issue, the Cereal Courier will appear semimonthly, the issues being dated the 15th and last day of each month. This semimonthly issuance will be continued until April 1, when the issuance of numbers at 10-day intervals will be resumed.

PERSONNEL ITEMS

Harold M. Adams, Charles E. Barth, and Eaton M. Summers, field assistants in barberry eradication in Nebraska since July 1, 1922, resigned November 17, having completed the duties for which they were appointed.

Dr. Joseph C. Arthur, Emeritus Professor of Botany, Purdue University, La Fayette, Ind., was appointed agent November 1 in order that he may give this Office the benefit of his services in the preparation of manuscripts embodying his wide knowledge of rust species and especially his more recent researches in connection with the heteroecious rusts which affect the cereals and related grasses.

Edward E. Clayton, collaborator in barberry eradication in cooperation with the Ohio State University resigned November 30 to accept a position as instructor at Cornell University, Ithaca, N. Y.

Elvin D. Dressel, Bernard F. Gaffney, Cyril H. Mains, and Lucius H. Moore, field assistants in barberry eradication with headquarters at East Lansing, Mich., completed their field duties November 15, on which date the appointments were terminated.

Leo J. Federer, field assistant in barberry eradication in Wisconsin since July 1, 1922, finished his duties October 31 and returned to college studies.

Forrest G. Inman and Lewis D. Ruder, field assistants in barberry eradication in Iowa since July 1, 1922, resigned November 16, having completed the duties for which they were appointed.

Dr. F. E. Kempton, pathologist in charge of barberry eradication, returned to Washington November 29. He attended the second annual meeting of The Conference for the Prevention of Grain Rust held at Minneapolis November 14. Together with State Leader N. F. Thompson he inspected some of the results obtained at Madison, Wis., by Dr. E. R. Schulz in laboratory experiments with chemicals used in the eradication of barberry bushes. Particularly interesting is the penetration of the chemicals to all parts of the plant when applied at certain periods of growth. In Indiana and Ohio Doctor Kempton conferred with State leaders and cooperators in regard to plans for work during the winter.

The growing of flax and wheat in mixtures, as practiced in Goodhue County, Minnesota, was discussed by C. L. Nolan, Chairman of the Flax Development Committee of the National Paint, Oil, and Varnish Association, and A. C. Dillman, agronomist in charge of flax investigations, at a luncheon at the City Club November 22. This luncheon was attended by the Chief of the Bureau of Plant Industry and representatives of the Office and of the Minnesota, North Dakota, South Dakota, Montana, and Iowa agricultural experiment stations. Mr. Nolan called later at the Office to discuss plans for conducting experiments with flax-wheat mixtures and for extending the growing of these mixtures by farmers.

L. J. Stadler, assistant professor of field crops at the College of Agriculture and the Agricultural Experiment Station of the University of Missouri, and agent of this Office in the cooperative investigations with cereals, arrived in Washington November 20 to attend the annual meeting of the American Society of Agronomy. He will remain for several weeks for research in the Department library.

VISITORS

L. E. Call, head of the department of agronomy at the Kansas Agricultural Experiment Station, visited the Office November 24 to consult with the cerealist and project leaders regarding cooperative cereal experiments in Kansas.

Leslie A. Fitz, formerly head of the department of milling industry of the Kansas State Agricultural College and the Agricultural Experiment Station, Manhattan, Kans., and since last August with the Fleischmann Laboratories of New York City, was an Office visitor November 15.

Dr. C. M. Haring, Director of the California Agricultural Experiment Station, and Dr. C. B. Hutchison, Director of the School of Agriculture, Davis, Calif., were Office visitors November 23, when they discussed cooperative cereal experiments on University Farm, Davis.

Dr. H. K. Hayes, professor of plant breeding, of the Minnesota Agricultural Experiment Station, and R. J. Garber, associate professor of agronomy of the College of Agriculture, University of West Virginia, were visitors at the Office during the week of November 20.

Dr. T. A. Kiesselbach and E. D. Holm, of the agronomy department of the Nebraska Agricultural Experiment Station, were Office visitors November 24 and 25 and consulted with project leaders with reference to experiments with corn and other cereals.

Director F. B. Linfield, of the Montana Agricultural Experiment Station was an Office visitor November 24, when he discussed cooperative cereal experiments on the Judith Basin Substation, Moccasin, Mont., and prospective experiments with corn at Moccasin and other Montana stations.

Ralph Merritt, President of the California Rice Growers' Association, San Francisco, Calif., and Dr. C. M. Haring, Director of the California Agricultural Experiment Station, called at the Office November 21 to discuss future plans for rice experiments in California, particularly with reference to the Biggs Rice Field Station, Biggs, Calif.

Dr. E. C. Stakman, pathologist of the Minnesota Agricultural Experiment Station, and agent of this Office, Dr. G. M. Coons, associate professor of botany of the Michigan Agricultural College and collaborator of this Office, and Harrison Fuller, secretary of The Conference for the Prevention of Grain Rust, Minneapolis, Minn., attended a meeting in the interests of emergency appropriation in the Office November 23. They are members of a delegation representing the farmers in the wheat-producing sections of the Middle West which has asked the House Appropriations Committee for $500,000 in the endeavor to eliminate black stem rust of wheat.

Prof. R. Summerby, field husbandman at Macdonald College, Quebec, consulted with project leaders on November 23.

Dr. R. W. Thatcher, Director of the New York State Agricultural Experiment Station, Geneva, N. Y., was an Office visitor November 24.

H. L. Walster, agronomist at the North Dakota Agricultural Experiment Station, consulted on November 24 with the cerealist and with project leaders regarding cooperative cereal experiments in North Dakota.

MANUSCRIPTS AND PUBLICATIONS.

A manuscript entitled "Polish and Poulard Wheats," by John H. Martin, was transmitted November 27 for publication as a Farmers' Bulletin.

A manuscript entitled "Grain Sorghum Experiments at the Woodward, Okla., Field Station," by John B. Swinbank, was transmitted November 28 for publication as a professional paper in the Department Bulletin series.

A paper entitled "Pollination in Alfalfa," by F. A. Coffman appears in The Botanical Gazette, v. 74, no. 2, p. 197-203, figs. 1-5. October, 1922.

The paper entitled "Flax and Wheat -- A Combination Crop," prepared by A. C. Dillman, appears on page 43 of the Convention Extra of The Oil, Paint and Drug Reporter, issued November 23.

Department Bulletin 1116, entitled "Seedling Blight and 'Stack-burn' of Rice and Hot-Water Seed Treatment," by W. H. Tisdale was received from the Government Printing Office November 24.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 14 December 15, 1922 No. 30
Personnel (Dec. 1-15) and Field Station (Nov. 16-30) Issue.

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PERSONNEL ITEMS

C. George Anderson, field assistant in barberry eradication in Minnesota since July 1, resigned November 30 and returned to college studies.

Dixon L. Bailey, agent engaged in cooperative studies on the epidemiology of black stem rust at the Minnesota Agricultural Experiment Station, was granted permission November 17 to pursue post-graduate study at the University of Minnesota during the current college year, looking toward the degree of Doctor of Philosophy. His course of study will include mycology, plant pathology, cytology, and plant breeding.

The following members of the Office staff have been authorized to attend the meetings of the American Association for the Advancement of Science and affiliated societies in Boston, Mass., from December 26 to December 30: C. R. Ball, H. B. Humphrey, A. G. Johnson, C. E. Leighty, F. D. Richey, and E. C. Stakman.

Burton B. Bayles, junior plant breeder, temporarily in charge of cooperative cereal investigations at Hays Branch Station, Hays, Kans., now at Manhattan, Kans., engaged in cooperative crop improvement, was granted permission December 4 to pursue graduate study at the Kansas State Agricultural College during the current college year, looking toward the degree of Master of Science in Agriculture. The course of study will include genetics seminar, crops problems, crops research, and botany seminar.

Israel P. Blauser, field assistant in barberry eradication with headquarters at Columbus, Ohio, finished his field duties November 30, on which date his appointment was terminated.

Allen R. Burr, Harry L. Edwards, Norman M. Sperl, field assistants in barberry eradication with headquarters at Madison, Wis., resigned at the end of November on the completion of their field duties.

Lyle A. Churchill, Harold H. Flor, and Franklin E. Fobes, all engaged as field assistants in barberry eradication in Minnesota during the past summer, resigned early in December, having finished their field duties.

J. Allen Clark, agronomist in charge of western wheat investigations, who is taking post-graduate study at the University of Minnesota, has been granted permission to extend his stay in Minnesota for three months longer, during which time he will continue the tabulation of the results of field experiments in 1922 and also his graduate study.

Ralph U. Cotter, junior agronomist and field assistant in barberry eradication in Wyoming, is assisting Doctor Stakman and his associates at the College of Agriculture of the University of Minnesota in compiling data on rust epidemiology and its relation to the common barberry. Mr. Cotter has just been granted permission to pursue post-graduate study at the University of Minnesota, looking toward the degree of Master of Science. The course of study will include genetics and plant pathology.

José L. Decena, the Filipino student who has been field assistant in corn disease investigations under the direction of Dr. G. N. Hoffer, at Lafayette, Ind., completed his duties November 30, on which date his appointment was terminated.

A. C. Dillman, agronomist in charge of flax investigations, will leave Washington December 16 to confer with C. T. Nolan, Chairman of the Flax Development Committee of the National Paint, Oil, and Varnish Association, and officials of the Minnesota and other agricultural experiment stations concerning the possible extension of the area of flax and wheat as a combination crop in the flax-producing sections.

Donald G. Fletcher, in charge of the cooperation in the barberry eradication campaign between this Office and the Conference for the Prevention of Grain Rust, and Leonard W. Melander, State leader of barberry eradication in Minnesota, attended the International Grain and Hay Show held at Chicago, Ill., December 2 to 9, to demonstrate methods of barberry eradication.

Miss Marion A. Griffiths, assistant pathologist stationed at the Missouri Botanical Garden, St. Louis, in the conduct of research on the flag smut of wheat in cooperation with that institution and the Illinois Agricultural Experiment Station, has been granted permission to pursue graduate study at Washington University, St. Louis, Mo., looking toward the degree of Master of Science. The course of study will include botany, physiology, and genetics.

Alva C. Hill, field assistant in barberry eradication in Iowa during the past four months, completed his duties on November 30, on which date his resignation became effective.

James R. Holbert, agronomist in charge of corn root, stalk, and ear rot investigations, in cooperation with Funk Brothers Seed Company, Bloomington, Ill., and the Illinois Agricultural Experiment Station at Urbana, was granted permission December 1 to pursue post-graduate study in organic chemistry at Illinois Wesleyan University and the University of Illinois, looking toward the degree of Doctor of Philosophy.

Miss Mary A. Hopkins, clerk, stationed at Urbana, Ill., in connection with the administration of the barberry eradication campaign in Illinois, has been granted permission to pursue post-graduate study in botany and plant pathology at the University of Illinois, looking toward the degree of Master of Science.

Charles O. Johnston, assistant pathologist engaged in investigations of cereal rusts conducted in cooperation with the Kansas Agricultural Experiment Station, has been granted permission to pursue post-graduate study in genetics and mycology at the Kansas State Agricultural College. The course includes genetics and mycology.

George C. Mayoue, assistant pathologist in the barberry eradication campaign in North Dakota, has been granted permission to pursue post-graduate study in plant pathology at the Agricultural College of North Dakota during the current school year.

Charles H. Miller, field assistant in barberry eradication in Indiana since June 1, 1922, finished his field duties November 30, on which date the appointment was terminated.

Frederick D. Richey, agronomist in charge of corn breeding and cultural investigations, attended the International Grain and Hay Show in Chicago during the first week of December, and the meetings of the International Crop Improvement Association. From the standpoint of number and quality of exhibits, the Show was the most successful ever held.

Ernest R Schulz, agent in the cooperative chemical studies on the composition of various portions of the barberry plant and the determination of the location and quality of poisonous compounds in bushes killed by chemical means, located at the Wisconsin Agricultural Experiment Station, was granted permission December 1 to pursue post-doctorate studies at the University of Wisconsin during the current college year. The course of study will include physical chemistry lectures and seminar on biochemistry methods.

Glenn M. Smith, assistant pathologist in the investigation of root, stalk, and ear rots of corn conducted in cooperation with the Purdue University Agricultural Experiment Station, LaFayette, Ind., has been granted permission to pursue post-graduate study at Purdue University, looking eventually toward the degree of Doctor of Philosophy.

Bruce J. Thornton, field assistant in barberry eradication with headquarters at Fort Collins, Colo., completed his field duties November 30, and his appointment was terminated on that date.

John F. Trost, assistant pathologist in the investigation of root, stalk, and ear rots of corn conducted in cooperation with the Purdue University Agricultural Experiment Station at LaFayette, Ind., was granted permission to pursue post-graduate study at Purdue University, looking eventually toward the degree of Doctor of Philosophy.

The appointment of Roy A. Weaver, junior analyst working under the direction of Dr. G. N. Hoffer in the cooperative corn-disease investigations at Purdue University Agricultural Experiment Station, was terminated December 15.

Gustav A. Wiebe, junior plant breeder in charge of the cereal experiments at the Aberdeen Substation, Aberdeen, Idaho, came to Washington December 14 to spend several months in the Office in the preparation of a report on the investigations of the past year, and in consultation with crop specialists and administrative officials.

VISITORS

Prof. W. E. Grimes, head of the department of agricultural economics at the Kansas State Agricultural College and Experiment Station, was an Office visitor December 13.

Dr. T. A. Lambie, a medical missionary from Addis Ababa, Abyssinia, was an Office visitor December 2. He has been commissioned to purchase agricultural machinery in the United States for the ruler of Abyssinia.

Prof. N. M. Tulaikov, President of the Russian State Institute of Experimental Agronomy at Petrograd, and for many years previous the director of the experiment station at Saratov in southern Russia, has just returned from eight weeks of travel during which he has studied soil and climatic conditions in the Great Plains and Pacific Northwest areas of this country and parts of Canada. He visited experiment stations from Saskatchewan to Kansas and west to British Columbia and Washington. Professor Tulaikov was an Office visitor December 14. He expects to attend the meetings of the American Association for the Advancement of Science and affiliated societies in Boston late in December, after which he will return to Russia.

MANUSCRIPTS AND PUBLICATIONS

A manuscript entitled "How to Grow Rice in California," by Jenkin W. Jones, was transmitted December 2 for publication in the Farmers' Bulletin series.

A manuscript entitled "A Study of Rust Resistance in a Cross between Marquis and Kota Wheats," by H. K. Hayes and O. S. Aamodt, was transmitted December 4 for publication in The Journal of Agricultural Research.

A manuscript entitled "The Mode of Inheritance of Resistance to Puccinia graminis with Relation to Seed Color in Crosses between Varieties of Durum Wheat," by J. B. Harrington and O. S. Aamodt, was transmitted December 4 for publication in The Journal of Agricultural Research.

A manuscript entitled "Studies in the Physiology and Control of Bunt or Stinking Smut of Wheat," by Horace M. Woolman and Harry B. Humphrey, was transmitted December 8 for publication as a professional paper in the Department Bulletin series.

A manuscript entitled "Summary of Literature on Bunt or Stinking Smut of Wheat," by Horace M. Woolman and Harry B. Humphrey, was transmitted December 9 for publication as a professional paper in the Department Bulletin series.

A brief paper entitled "Experiments with Hot Water, Formaldehyde, Copper Carbonate, and Chloropnol for the Control of Barley Smuts," by W. M. Tisdale, J. W. Taylor, and Marion A. Griffiths, was approved December 9 for publication in Phytopathology, without compensation to the authors.

A paper entitled "Naked Oats," by T. R. Stanton, was approved December 14 for publication in the Journal of Heredity, without compensation.

Request was made December 2 for revision of Farmers' Bulletin 998, entitled "Standard Broom Corn," by Benton E. Bathgeb, formerly of this Office.

Page proof of Farmers' Bulletin 1250, entitled "Destroy the Common Barberry," by E. C. Stakman, was read December 14.

Farmers' Bulletin 1281, entitled "The Hard Red Spring Wheats," by J. Allen Clark and John H. Martin, was received from the Government Printing Office December 4, 1922.

Farmers' Bulletin 1280, entitled "The Hard Red Winter Wheats," by J. Allen Clark and John H. Martin, was received December 7, 1922, from the Government Printing Office.

PAPERS FOR BOSTON MEETINGS

The following papers have been approved for presentation at the fourteenth annual meeting of the American Phytopathological Society, in connection with the annual meeting of the American Association for the Advancement of Science in Boston, Mass., during the last week in December. Most of these papers present results of research conducted cooperatively with various State experiment stations, and abstracts have been approved for publication in Phytopathology.

A Disease of Flax Caused by a Species of Rhizoctonia, by L. E. Brentzel.

A Disease of Flax not Previously Reported in the United States, by L. E. Brentzel.

The Influence of Soil Temperature and Moisture on the Development of Seedling Blight of Wheat and Corn Caused by Gibberella saubinetii (Mont.) Sacc., by James G. Dickson.

Occurrence of Zonate Eye-Spot on Various Grasses and its Mode of Extension, by Charles Drechsler.

The Influence of Soil Temperature and Moisture on the Chemical Composition of Wheat and Corn and their Predisposition to Seedling Blight, by Sophia H. Eckerson and James G. Dickson.

Influence of Temperature on the Morphology of Fusarium Spores, by Helen Johann.

Relation of Environment to Infection of Corn Seedlings by Diplodia zeae (Schw.) Lev., by Helen Johann, James G. Dickson, and Grace O. Wineland.

Progress in Barberry Eradication, by F. E. Kempton.

Biologic Specialization of Puccinia graminis secalis, by M. N. Levine and E. C. Stakman.

Aecial Stages of the Leaf Rust of Barley, Puccinia simplex, and of Rye, Puccinia dispersa, in the United States, by E. B. Mains and H. S. Jackson.

Strains of the Leaf Rust of Wheat, Puccinia triticina, in the United States, by E. B. Mains and H. S. Jackson.

Intercellular Bodies Associated with the Rosette Disease of Wheat, by H. H. McKinney, Sophia H. Eckerson, and R. W. Webb.

Intracellular Bodies Associated with a "Mosaic" of Hippeastrum johnsonii, by H. H. McKinney, Sophia H. Eckerson, and R. W. Webb.

Corn Root, Stalk, and Ear Rot Disease Investigations in Kansas: Report of Progress, 1922, by L. E. Melchers and C. O. Johnston.

Biologic Specialization of Puccinia graminis avenae, by E. C. Stakman, M. N. Levine, and P. L. Bailey.

Modified and Simplified Hot-Water and Vapor Treatments for the Control of Loose Smut in Wheat, with Special Reference to Seed Injury, by V. F. Tapke.

Eradicating the Common Barberry by Means of Chemicals, by Noel F. Thompson.

Organic Mercury Seed Disinfectants, by W. H. Tisdale and J. W. Taylor.

The Production of Conidia at Night in Species of Sclerospora, by W. H. Weston, Jr.

The Production in Culture of the Ascigerous Stage of Fusarium moniliforme, by Grace O. Wineland.

Cytological Studies on the Infection of Wheat Seedlings by Tilletia tritici (Bjerk.) Wint., by H. M. Woolman.

The following papers have been approved for presentation before the Section of Plant Physiology of the Botanical Society of America:

Variability in the Acidity of Corn with Special Reference to Vigor, by Annie May Hurd.

Absorption of Sodium Arsenite by the Common Barberry, by Noel F. Thompson and E. R. Schulz.

A paper entitled "Accumulation of Iron and Aluminum Compounds in Corn Plants and Its Probable Relation to Disease," by G. N. Hoffer and John F. Trost, has been approved for presentation before the American Society of Agronomy, and another entitled "A Quantitative Method of Determining Small Amounts of Arsenic in Plant Tissue," by E. R. Schulz, will be presented before the Chemical Section of the American Association for the Advancement of Science.

Memorandum

On November 23 the staff of the Office was invited by Dr. C. R. Ball to see, in the motion picture laboratory of the Department, the interesting film prepared by the Conference for the Prevention of Grain Rust to illustrate methods of barberry eradication and the breeding of rust-resistant wheats.

This film was specially prepared for presentation before the second meeting of the Conference for the Prevention of Grain Rust in Minneapolis, November 14.

Last summer a special motion picture, entitled "The Barbarous Barberry," was prepared by this Office, of which 16 reels are in circulation throughout the region of the United States where the barberry bush is an enemy of the wheat grower.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens, and Substations (R. R. Childs). No report.

SOUTH CAROLINA

Pee Dee Substation, Florence (J. M. Hammerly). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). (Dec. 11) Precipitation since the seeding of the winter grains has been light. The barley plants appeared to have been most affected by the want of moisture, as considerable "yellowing" of the leaves existed during the latter part of November. At present the condition of this crop is improved. Winter wheat and rye sown during the second week of October have made vegetative growth less than usual for this season of the year. However, the crop as a whole is in good shape for the winter season. Oats continue to be in excellent condition. In the oat and barley nurseries, growth has been more rapid and some of the varieties or strains now show a spring habit of growth.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). (Dec. 11) The weighing of the grain and the calculation of the yields of material from the oat and barley nurseries is under way. It is evident from the results already obtained that the Cornellian again heads the list of oat varieties. In this connection the appended table showing the results of oat tests in several counties during this past year will be of interest.

The last sowing of the material in the greenhouse has been made. Some of this material consists of types for further hybridization work, some seed for growing first-generation hybrids of both wheat and oats, and some material from species crosses in wheat which we wanted to observe at Ithaca and which were not hardy enough to come through the winter.

The preparation of the material for the annual report is under way, and when the yields and other notes for the past year are all completed, the report will be ready for presentation.

The following have been visitors at the Plant Breeding Department since the last report: Prof. T. A. Kiesselbach of Nebraska, Prof. G. A. Brown of Michigan, and Dr. F. W. Hilgendorf of New Zealand.

Comparative Oat Varietal Experiments, 1920

Following are the acre yields in bushels, by counties, of oat varieties grown by farmers in cooperative experiments:

Acre yields in bushels, by counties, of oat varieties grown by farmers in cooperative experiments, 1922.

Variety	Jefferson	St. Lawrence	Lewis	Delaware	Dutchess	Ontario	Genesee	Ave.	Ranking of varieties in per cent.
Cornellian	41.2	46.2	58.0	72.1	54.6	43.3	81.0	56.6	100.0
National 127-9	44.0	41.3	53.3	73.8	40.2	38.9	79.5	53.0	93.6
Empire	50.7	40.7	51.4	68.1	37.4	40.8	73.7	51.9	91.4
President 129-44	46.3	39.7	49.5	65.0	33.2	34.9	89.5	51.2	90.5
Victory	38.4	36.9	51.4	73.2	34.6	34.7	79.9	49.8	88.0
Kelvedine	36.6	41.8	50.0	66.6	41.2	37.3	73.6	49.6	87.6
Wisconsin No. 5	44.6	39.8	52.9	66.0	35.2	35.9	71.0	49.3	87.1
Standwell	38.5	37.9	49.4	66.5	36.6	33.2	75.3	49.1	86.7
Silvermine 126-16	37.1	38.4	47.1	72.4	30.6	37.6	80.4	49.1	86.7
College Wonder	40.8	40.1	47.4	56.4	32.0	32.7	72.6	47.7	84.3
Conewell	33.2	39.6	52.5	66.7	35.3	40.7	64.3	47.8	84.1
Selection 343	38.3	36.5	49.5	65.8	35.0	32.0	72.0	47.0	83.0
Mammoth Cluster (side oat)	32.3	32.7	38.2	61.7	29.6	26.8	61.6	39.9	70.4

MID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins). (Nov. 23) Since the last report the Rice Experiment Station has shown varietal and other rice material at Jennings and Lake Charles. The same material was used at these points as at Shreveport, except that threshed samples of rice and samples of soy beans both threshed and unthreshed were added. The exhibit at Lake Charles was placed at the request of the American Rice Growers' Association and occupied part of their space, but was distinct from their exhibit. The Association had an attractive booth in which rice was served at intervals during the day. The variety served was Fortuna, although this fact was not advertised. The material from the station attracted much attention at both Jennings and Lake Charles, and many questions were asked about rice and about the work of the station. In the rice carnival at Lake Charles, Miss Wright, the station stenographer, represented the city of Crowley on the rice millers' float.

Yesterday the harvesting of soy beans was finished, having been delayed by heavy rains. During the night of November 12, a precipitation of slightly more than six inches was recorded, - the heaviest ever recorded for so short a period. More rain fell during the day, making a total of 6.37 inches for 2-hours. Since that time another heavy rain has fallen. It is believed that this is the greatest precipitation ever recorded here for the month of November.

There was no loss in Biloxi beans on account of the weather, and the yields were very good; however, the Barchet sustained very heavy loss on account of heavy growth. They were flooded for about 12 hours, causing the lower branches to become embedded in the soil. This made it impossible for the harvester to lift them up without breaking, and resulted in our obtaining only about one-third of the total number of beans on the plants. The small field of beans near the house yielded nearly 15 bushels to the acre. I understand that Mr. Kaplan still has about 25 acres to harvest and is getting an average yield of about 10 bushels. The harvesters have been handicapped by the unusual weather conditions.

We have done no rice thrashing so far on account of the weather, with the exception of a little hand thrashing that is now under way. The weather is too unsettled to attempt using the machine.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler). No report.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

Iowa State College, Ames (Barberry Eradication, J. H. Muncie). No report.

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert). No report.

Post Office Building, Urbana (Barberry Eradication, G. H. Farrell). (Dec. 5) Mr. Farrell has been absent during November in establishing rust overwintering stations at Cairo, Urbana, and Chicago. Some difficulty is being experienced because of the late start. Weather conditions have not been favorable for the development of rust on the greenhouse pots and outdoor plats because of the large number of cloudy days during November.

Barberry bushes on a few additional properties in northern Illinois were treated with crushed rock salt on November 10 and 11. A number of areas of escapes were resurveyed during the month, and it seems highly advisable that chemicals should be used on a large scale next year.

On November 20 an inspection was made of the barberry chemical-eradication experiments at Gurnee by P. A. Glenn of the Illinois State Department of Agriculture, Noel F. Thompson in charge of the chemical work, and the State leader.

During the latter part of the month this Office cooperated with the Conference for the Prevention of Grain Rust, of Minneapolis, in establishing a barberry demonstration at the International Grain and Hay Show to be held at the International Livestock Exposition, Chicago, December 2 to 9. A potted common barberry bush was sent, and H. F. Seifert, of the Illinois State Department of Agriculture, made arrangements to furnish a Japanese barberry bush. Mr. Melander and Mr. Fletcher will be in active charge of the demonstration.

INDIANA

Purdue University Agricultural Experiment Station, LaFayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer). (Nov. 21) Mr. Duddleston has just finished assisting the Soils and Crops Department in harvesting their plats of various strains of dent corn. These experiments were located in Warren, Vermillion, Fountain, White, Benton, and Tippecanoe counties. Approximately 4 to 5 per cent of the ears in these plats were infected with Diplodia. On the whole, the corn was well matured.

The greenhouse experiments are well under way. The inbred strains of corn which have been obtained in the field experiments during the past year are being studied in both the soil beds and in the germinators.

The temperature-nutrition tanks have been constructed and certain inbred lines are being experimented upon to learn more regarding the absorption capacities of the different strains and their relation to susceptibility to the various organisms.

The corn root rot panels have been sent to County Agent East at Shelbyville, Ind., for use during the annual corn show this week. This show is perhaps the largest one held in the State. An attempt is being made to stress the improved methods of corn production by the use of many related educational exhibits.

G. N. Hoffer addressed the Indiana Canners at their convention at Evansville, Ind., on November 14. The physiological and pathological investigations of sweet corn were discussed, and the vast importance of obtaining improved strains for the canners and the intelligent use of fertilizers were stressed.

It is gratifying to learn that resolutions were passed in which the Indiana Canners have endorsed the program of work being followed by the United States Department of Agriculture and the Purdue University Agricultural Experiment Station in the improvement of sweet corn.

Purdue University Agricultural Experiment Station, LaFayette (Leaf Dust Investigations, H. S. Jackson and E. B. Mains). No report.

Purdue University, College of Agriculture (Barberry Eradication, K. E. Beeson). (Dec. 1) One team has been engaged in resurvey during November. A low percentage of sprouts has been found. Several cases of rather long-standing contention have been settled by the removal of the bushes.

Another argument in favor of barberry eradication has been revealed through the zealous efforts of this team. The bush is not only a vicious enemy of the wheat crop, but an ally to the demon rum. Hidden snugly in the crown of a big bush the boys found a bottle of "white mule." Since this property of the barberry has become known, the office has been flooded with applications for work for next year.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, John W. Baringer). (Nov. 15-30) During the last two weeks in November the original rural survey of Marion County was completed and considerable progress was made in Seneca County. In addition the original survey of Toledo was practically completed. An attempt will be made to complete the survey of Seneca County before January 1.

In 1919 the County Agricultural Agent at Tiffin received a report from southern Seneca County, of stem rust damage to wheat. The report was filed in the office of the State Barberry Leader. In 1922 stem rust was severe in the same neighborhood. The situation was given attention on November 27. W. F. Stever lives in Seneca County about four miles southwest of Melmore. This year all of the straw in his 70-acre wheat field was covered with black stem rust. It yielded 8.6 bushels of unsalable shrunken grain per acre. About 25 escaped barberry bushes were found on two sides of the field, some of them only 4 rods distant.

The State leader made a trip to Lexington, Ky., and Cincinnati to arrange for stem-rust overwintering studies.

Dr. F. E. Kempton visited our Columbus office on November 28.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy). (Nov. 29) The present season's survey was discontinued in Michigan November 15, when field assistants Gaffney, Moore, Dressel, and Mains resigned. Eighteen men were employed until the last of September, when the force was reduced to the assistants just named, who were used in resurvey. The three southern tiers of counties, a total of twenty, have been covered in the farm-to-farm survey. The resurvey has been completed in all of the counties which were covered in the farm-to-farm survey previous to July 1, 1922. All of the cities within these counties were resurveyed, with the exception of Detroit. The original survey was made in Detroit and two men remained in the city to revisit all places where bushes were not removed when originally located. All bushes found in Detroit have been removed, but doubtless some plantings previously overlook-

will be found on resurvey. Some sprouts may also be expected to appear. The Detroit city forester has had his assistants revisit locations on [illegible] hopeful that the number of sprouts will not be great.

Field assistants have been able to dig bushes in cultivated areas with sufficient thoroughness to prevent sprouting, but the removal of bushes from escaped areas has been of such a nature that sprouts usually are found on resurvey. The men seem to be as careful when working in these areas as when they are digging the cultivated bushes, but probably the conditions under which the escaped bushes grow cause them to be more persistent than the cultivated bushes.

Dr. L. R. Hesler of the Botany Department of the University of Tennessee assisted in the barberry eradication campaign during the first two months of the past season's work. He was very helpful in training the young men engaged in the survey, both in matters of a technical nature and in tactful methods of approaching property owners. Dr. Hesler visited practically all of the areas of escaped barberries in the counties in which the farm-to-farm survey was conducted. He prepared maps and established the boundaries of these areas, thus giving us reliable information on which we could plan eradication to the best advantage.

The success of the barberry eradication campaign in Michigan depends primarily upon the possibility of eradication by means of chemicals. Education and observations generally have convinced everyone that the common barberry is instrumental in the spread of rust, and no one doubts that there are a vast number of bushes within the State, but the big question is how to remove them. Unfortunately, surveys must be made at the time of year when the farmer is the busiest. The average farmer does not feel that he can stop his regular farm work and devote extended time to the eradication of barberries, no matter how enthusiastic he may be about cooperation. Much time and effort may be spent in the endeavor to dig escaped bushes, but it is discouraging to revisit the location and find that the number of sprouts exceeds the number of original bushes. We must have a treatment that is cheap and sure, and that is not too difficult to apply.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, William A. Walker). (November report) Field scouting continued into November was discontinued recently because of bad roads and disagreeable weather. Three field men scouting 21 townships in the western part of Dane county, almost completed the farm-to-farm survey of this county. The large area of escapes at Black Earth had been heretofore scouted on foot. A new area of escapes was located in Montrose township in the southern part of Dane county. This area consisted of about 150 bushes located on three properties.

Overwintering of rust will be observed and studied throughout the winter. Some black stem rust has been located on grain on the University Farm. If possible, a few rust stations will be located in various sections of the State. Greenhouse plantings of wheat and rye are coming along nicely. They will be used for further study on the overwintering of urediniospores and the urediniospore mycelium.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman). No report.

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander). No report.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). (Dec. 1) The last half of November was dry and the temperature was moderate for this time of the year. Due to the showers early in the month, wheat has made fair growth and is now furnishing considerable pasturage over the county.

This morning the last barn full of sorghum shocks was hauled in and these are now being headed. When these are thrashed the field work will be finished for this year.

Yields not previously reported:

Acme broomcorn, date-of-seeding experiment

July 1: Poor brush,	25	pounds per	acre
Good "	475	" "	"
Total	500	" "	"

Varietal plats, grain sorghums

Variety	C.I.No.	Yield, bus. per acre
Standard Yellow milo	234	19.01
Dwarf Yellow milo	332	20.45
Standard White milo	352	16.29
Early White milo	480	21.33

Date-of-seeding experiment, Dwarf Yellow milo, C.I.No. 332

Date	Yield, bus. per acre
April 15	10.34
May 2	6.46
May 16	20.17
May 31	21.20
June 15	31.29
July 1	Not thrashed yet.

Maximum temperature for last half of November, 70° on the 19th; minimum temperature for the same period, 23° on the 23rd. Precipitation, 0.03 inch, which fell in three showers.

KANSAS

Agricultural Experiment Station, Manhattan (John H. Parker). No report.

Hays Branch Experiment Station, Hays (B. B. Bayles). No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). No report.

Agricultural College, Ft. Collins (Barberry Eradication, D. A. Imsgren). No report.

NEBRASKA

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel). No report.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). No report.

College of Agriculture, University of Wyoming, Laramie (Barberry Eradication, Ralph U. Cotter). No report.

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, Lynn D. Hutton). No report.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel). No report.

Agricultural Experiment Station, Agricultural College (Barberry Eradication, George C. Mayoue). (November report) During the month no original farm-to-farm survey was made, field operations having ceased October 23.

Fourteen bushes on three properties have been reported by people who were not the owners. The latter were notified and instructed how to make a complete eradication. The bushes have all been eradicated, according to statements from the ones who made the original reports.

Nine days were devoted to resurvey, checking properties in Cass county, mostly in the vicinity of Fargo. While in the resurvey, several talks including demonstrations were made in rural schools. The teachers and students were much interested in the campaign.

The State leader attended the second annual meeting of the Conference for the Prevention of Grain Rust at St. Paul, Minn., November 14.

All plans have been made to place literature and posters in every school in the State, for distribution. All this material will be sent from this office during the month of December. Preparation of the annual report has been begun.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) No report.

Dickinson Substation, Dickinson (Ralph W. Smith). No report.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. Mar[illegible]). (Nov. 29) The month of November, like the months of August, September, and October, has been dry. The precipitation during November, 0.31 inch, however, approached more nearly

the average for the month (0.66 inch) than for that of any of the three preceding months. The total precipitation for August, September, October, and November was 2.40 inches, while the average for these months is 4.67 inches. The minimum temperature for the month of November was 5° above zero on the 29th, while the maximum temperature was 62° on the 27th.

The dry fall has delayed the emergence of fall-sown wheat throughout the Judith Basin. In most of the fields that the writer has observed, less than 50 per cent of the wheat has emerged. Most of the wheat probably has germinated but lies dormant beneath the surface of the soil. On many of the plats on the Substation none of the wheat has emerged. It has been impossible to make stand counts in the winter-wheat hybrid nursery because of uneven emergence.

The straw mulch has been spread on half of the plats in the experiment comparing the furrow drill and the ordinary drill for sowing winter wheat.

The writing of the 1922 annual report is now in progress.

The dairy barn which is being constructed here is practically completed, and the painters are now at work. Preparations are being made for the writer to move from the town of Moccasin, where he has lived for the past three years, into the bunk-house at the Substation.

Following is a preliminary report of the yields of spring wheat, oats, barley, and flax varieties at Moccasin, Mont., in 1922. These figures are subject to revision on further checking, but are approximately correct.

SPRING WHEAT

The following varieties were grown in replicated hundredth-acre plats:

Variety	C.I.No.	Acre yield, bus.	Variety	C.I.No.	Acre yield, bus.
Hard Red Spring:			White:		
Red Bobs	6235	35.3	White Federation	4981	36.2
Kitchener	4800	29.4	Federation	4734	35.3
Red Sask	6794	29.4	Hard Federation	4733	34.2
Power	3697	27.7	Early Baart	1697	30.1
Marquis	3641	27.3	Durum:		
Preston	5081	26.8	Kubanka No.74	....	30.7
Kota	6248	26.5	Acme	5284	27.7
Ladoga	6079	25.7	Pelissa	1584	27.5
Ruby	6047	25.0	Kubanka No.98	6519	26.5
Haynes	2874	21.3	Monad	3320	26.2
			Kahla	5529	25.7
			Kubanka	1440	24.8

The following varieties, with the exception of Quality, were grown in single plats, Quality having been grown in duplicated plats:

Garnet	5007	34.2	Quality	6607	33.8
Red Bobs	6235	30.8	Canadian Marquis	....	27.5
.....	3774	30.7	Barbastar	3727	25.0
Canadian Marquis	....	30.0	Turcicum	3741	25.0
Quality	6607	29.6			

Plats of Marquis wheat were sown in the spring of 1922 with the furrow drill and with the ordinary drill, 6 plats being sown with each. Three plats sown with each drill were harrowed, one when the wheat was 3 or 4 inches high, and two when the wheat was 5 or 6 inches high. The wheat in the furrow-drill plat, harrowed when the plats were 3 or 4 inches high, was injured by the harrowing, many of the plants being covered with the soil worked into the furrows. Therefore, the harrowing of the other plats was delayed until the plants were larger. The wheat sown with the furrow drill and not harrowed averaged 31.4 bushels to the acre, while the plats sown with the ordinary drill and not harrowed yielded 31.3 bushels. The harrowed plat yielded 29.2 and 31.3 bushels, respectively, on the plats sown with the furrow drill and the ordinary drill. The lower yield of the harrowed furrow-drill plats was due almost entirely to the low yield of the plat harrowed early. There appeared to be no advantage in sowing spring wheat with the furrow drill, or from harrowing wheat sown with the ordinary drill, while there was a loss from harrowing wheat sown with the furrow drill.

OATS

The following varieties of oats were grown in replicated plats:

Variety	C.I.No.	Yield (bus.)	Variety	C.I.No.	Yield (bus.)
Early Yellow or White:			Midseason White:		
Richland	787	72.1	Dakota No.4	753	71.4
Sixty-Day	165	69.1	Danish	[illegible]	70.0
Sixty-Day	169	69.1	Silvermine	714	70.0
Alaska	729	[illegible]	Lincoln	[illegible]	70.0
Nebraska No.21	841	64.2	Swedish Select	154	69.3
			Banner	731	67.9
			Victory	742	[illegible]

Five unnamed varieties of oats were grown in 1922 in single plats, from which the following yields were obtained:

Source	C.I.No.	Yield (bus.)
Siberia	749	72.7
Siberia	828	64.1
Prince Edward Island	617	63.3
Russia	716	62.5
Siberia	823	57.0

BARLEY

Yields of barley varieties grown in replicated plats in 1922 were as follows:

Variety	C.I.No.	Yield (bus.)	Variety	C.I.No.	Yield (bus.)
Two-rowed:			Six-rowed:		
Horn	926	45.9	Moloy	1176	52.7
Svanhals	187	43.1	Glue Mariout	261	52.0
White Smyrna	195	42.4	Coast	690	49.6
White Smyrna*	910	40.6	Himalaya	820	41.3
Hannchen	531	40.4	Manchuria*	244	41.1
Franconian	680	33.5	Julv*	1563	34.9
			Nepal*	535	28.6

* Grown in single plats only.

FLAX

Yields of flax varieties in 1922 were:

Variety	C.I.No.	Yield (bus.)	Variety	C.I.No.	Yield (bus.)
Montana Common	6	8.6	Reserve	19	7.1
N.D.R. No.114	13	7.6	Damont	3	7.0
N.D.R. No. 52	8	7.5	N.D.R. No.73	14	6.3
Primost	47	7.4	Fargo Common	18	5.2

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher). No report.

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (A. E. McClymonds). No report.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens). No report.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones). No report.

University Farm, Davis (V. H. Florell). (Dec. 1) The sowing of the cereal experiments was completed today. Varieties of wheat in replicated plats were sown first, beginning November 17. They are now emerging. The weather has been excellent for seeding operations, with the land in good tilth and with optimum moisture conditions. Several light rainstorms came in October and heavy rains from November 6 to 9, so that moisture conditions for seeding and plowing for winter grain are very favorable.

Twenty-two varieties and selected strains of wheat, 26 of barley, and 3 of oats were sown in fiftieth acre plats replicated 5 times. Comparative wheat nursery experiments were sown in over 3,000 rows. With the exception of the classification nursery material, most of the varieties were replicated 5 times in groups of 3 rows each. The wheat hybrid nursery contains over 8,000 5-foot rows, with nearly 1,400 rows additional for Dr. Love.

The majority of the farmers is not practicing early fall sowing in this section. There is, however, considera le early sown grain, and fields that have been observed show very good emergence.

The precipitation for October was 1.56 inches. Of this, 0.49 inch fell on October 2 and 3; 0.40 inch on October 8 and 10; and 0.57 inch on October 27 and 28. The November rainfall was 3.29 inches from the 6th to the 9th.

Agricultural Experiment Station, Berkeley (Fred M. Briggs). No report.

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Dec. 14 - 31
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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations.
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

Vol. 14 December 31, 1922 No. 31
Personnel (Dec. 16-31) and Project Issue

PERSONNEL ITEMS

Mrs. Agnes C. Anderes has been appointed clerk in connection with the cereal-disease investigations conducted in cooperation with the California Agricultural Experiment Station at Berkeley, Calif. Mrs. Anderes succeeds Miss Lois Atkins who resigned October 31, 1922.

Dr. Carleton R. Ball, W. E. Brentzel, Dr. G. N. Hoffer, Dr. H. B. Humphrey, Dr. Annie M. Hurd, Dr. H. S. Jackson, Dr. A. G. Johnson, Dr. F. E. Kempton, Dr. C. E. Leighty, Dr. M. N. Levine, H. H. McKinney, J. H. Parker, F. D. Richey, and Dr. E. C. Stakman represented the Office at the meetings of the Association for the Advancement of Science and affiliated Societies held in Boston from December 26 to 30, inclusive.

John W. Baringer, assistant pathologist and detailed as State leader of barberry eradication in Ohio, has been granted permission to pursue post-graduate study at Ohio State University during the winter quarter, from January 1 to March 30,1923, looking toward the degree of Master of Science. The course of study will include evolution of plants, mycology, plant pathology, and botanical seminary.

W. E. Brentzel, assistant pathologist in the investigation of diseases of flax, in cooperation with the North Dakota Agricultural Experiment Station, arrived in Washington December 26 to prepare his annual report on flax-disease experiments and to make special studies on the pasmo disease of flax caused by Phlyctaena linicola, and to consult with administrative officers.

N. R. Carmichael, who has been assisting Doctor Kempton in the general conduct of the barberry eradication campaign, left Washington December 21 for Iowa and Minnesota to confer with State leaders and assistants. He will spend nearly two months in Minneapolis in ccoperation with the Conference for the Prevention of Grain Rust. During this period Donald G. Fletcher, the assistant pathologist who has been collaborating with the officials of the Conference, will come to Washington to assist in assembling data on the results of the campaign of 1922 and to familiarize himself with the methods of coordinating the field operations.

Gordon C. Curran, assistant pathologist and leader of the barberry eradication campaign in Illinois, has been granted leave without pay to enable him to pursue graduate study in botany and plant pathology at the University of Minnesota during the two months from January 16 to March 15, 1923.

Miss Lyrel Johnston, field assistant in barberry eradication in Iowa since July 1, 1922, completed her field duties December 31, on which date her appointment was terminated.

Edmund J. Kotlar and Leon G. Samsel, field assistants in barberry eradication in Nebraska during the past summer completed their field duties and resigned December 31 and 23, respectively.

Karl P. Link, field assistant in cereal investigations conducted in cooperation with the Wisconsin Agricultural Experiment Station, completed his work on December 31, on which date his resignation became effective.

H. H. McKinney, pathologist in the investigations of rosette and 'take-all' diseases of wheat, has been authorized to consult with the Spencer Lens Company, of Buffalo, N. Y., regarding scientific apparatus, visit Columbia University and the New York Botanical Garden to confer with officials and to examine herbarium specimens, and to consult with Dr. William Crocker, of the Thompson Institute for Plant Research, Yonkers, N. Y., concerning the rosette disease of wheat. Mr. McKinney will come to Washington early in January to consult with administrative officers.

Clyde F. Shackson, field assistant in barberry eradication in Ohio since July 12, 1922, completed his duties and resigned on December 26.

Marion A. Smith, field assistant in barberry eradication, with headquarters at Ames, Ia., resigned December 15, having completed his duties on that date.

Dr. L. J. Stadler, agronomist at the Missouri Agricultural Experiment Station and agent of this Office in the cooperative investigations with cereals, returned to Columbia December 23 after a month's research in the Department library.

The appointment of Howard A. Taft, agent in the barberry eradication campaign conducted in cooperation with the Michigan Agricultural Experiment Station, was terminated December 31.

VISITORS

Hart Hall, Director of Plans, Spring Wheat Crop Improvement Association, of Minneapolis, visited the Office December 28 in company with John A. Slipher, of the National Lime Association.

PUBLICATIONS IN 1922

The following 27 papers, resulting from the work of the Office of Cereal Investigations, were published during the calendar year 1922 in the various series of Departmental publications, in the bulletin and circular series of the cooperating State agricultural experiment stations, and in private journals. The list of publications would have been longer and the accompanying list of manuscripts in press would have been shorter except for the suspension of the Journal of Agricultural Research from December 1, 1921, to December 31, 1922.

AGRONOMIC SUBJECTS

Corn

Effects of Mutilating the Seeds on the Growth and Productiveness of Corn, by E. B. Brown. U. S. Dept. Agr. Bul. 1011, 14 p., 3 pl. Literature cited, p. 14. Issued Feb. 23, 1922.

Effect of Date of Seeding on Germination, Growth, and Development of Corn, by E. B. Brown and H. S. Garrison. U. S. Dept. Agr. Bul. 1014. 11 p. Issued Jan. 11, 1922.

Improving the Yield of Corn, by G. N. Hoffer. In Canning Age, p. 44-45, May 15, 1922, 4 fig.

Selecting Seed Corn in the Field, by G. N. Hoffer and A. D. Wenck. Ind. Agr. Exp. Sta. Ext. Bul. 108, 12 p., 12 fig. Issued July, 1922.

The Corn Crop, by C. E. Leighty, C. W. Warburton, O. C. Stine, and O. E. Baker. Yearbook Dept. Agr., 1921 (Sep. 872), p. 161-226, 51 fig. Issued 1922.

The Experimental Basis for the Present Status of Corn Breeding, by F. D. Richey. In Jour. Amer. Soc. Agron., 14: 1-17, Jan.-Feb., 1922.

The Use of the Greenhouse in Corn Breeding, by F. D. Richey. In Jour. Hered., v. 12, no. 9, p. 393-396, 2 fig. Published April 15, 1922, in November, 1921, issue.

Wheat

Wheat Production and Marketing, by C. R. Ball, C. E. Leighty, O. C. Stine, and O. E. Baker. Yearbook Dept. Agr. (Sep. 873), 71-160, 72 fig. Issued Sept. 1922.

The Hard Red Winter Wheats, by J. Allen Clark and John H. Martin. U. S. Dept. Agr. Farmers' Bul. 1280, 10 p., 2 fig. Issued October, 1922.

The Hard Red Spring Wheats, by J. Allen Clark and John H. Martin. U. S. Dept. Agr. Farmers' Bul. 1281, 28 p., 11 fig. Issued November, 1922.

Classification of American Wheat Varieties, by J. Allen Clark, John H. Martin, and Carleton R. Ball. U. S. Dept. Agr. Bul. 1074, 258 p., 60 pl., 76 fig. Literature cited, p. 219-230. Issued Nov. 8, 1922.

Wheat Growing after Fallow in Eastern Oregon, by D. E. Stephens and Geo. R. Hyslop. Oreg. Agr. Exp. Sta. Bul. 190, 35 p., 13 fig. Issued May, 1922.

Barley

Germination of Barley Seeds Harvested at Different Stages of Growth, by Harry V. Harlan and Merritt N. Pope. In Jour. Hered., v. 13, no. 2, p. 72-75, fig. 16. Feb. 1922 (Issued Sept. 7, 1922).

Trebi Barley, A Superior Variety for Irrigated Land, by Harry V. Harlan, Merritt N. Pope, and Louis C. Aicher. U. S. Dept. Agr. Circ. 208, 8 p., 2 fig. Issued October, 1922.

Rice

Wild Rice, by Charles E. Chambliss. U. S. Dept. Agr. Circ. 229, 16 p., 9 fig. Issued August, 1922.

Flax

Flax and Wheat - A Combination Crop, by A. C. Dillman. In The Oil, Paint, and Drug Reporter, Convention Extra, p. 43, Nov. 23, 1922.

General or Miscellaneous

Federal and State Cooperation in Cereal Research, by Carleton R. Ball. In Ann. Rep. Land-Grant Coll. Assoc., 1921. Issued 1922.

Experiments with Cereals on the Belle Fourche Experiment Farm, by John H. Martin. U. S. Dept. Agr. Bul. 1039, 72 p., 22 fig. Issued May 5, 1922.

PATHOLOGIC SUBJECTS

Imperfect and Sac Fungi

Wojnowicia graminis (McAlp). Sacc. and D. Sacc. on Wheat in the United States, by H. H. McKinney and A. G. Johnson. In Phytopath., 11: 505-506. Published April 20, 1922, in Dec. 21, 1921, issue.

Seedling Blight and 'Stack-Burn' of Rice and the Hot-Water Seed Treatment, by W. H. Tisdale. U. S. Dept. Agr. Bul. 1116, 11 p., 6 pl., 2 fig. Issued Nov. 13, 1922.

Relation of the Character of the Endosperm to the Susceptibility of Dent Corn to Root Rotting, by John F. Trost. U. S. Dept. Agr. Bul. 1062, 7 p., 2 pl. Issued April 22, 1922.

Rusts

Wheat Stem Rust from the Standpoint of Breeding, by H. K. Hayes and E. C. Stakman. In Proc. West Canada Soc. Agron. (Winnipeg), v. 1, no. 2.

The Relation of Temperature and Hydrogen-Ion Concentration to Urediniospore Germination of Biologic Forms of Stem Rust of Wheat, by C. R. Hursh. In Phytopath., v. 12, no. 8, p. 353-361, 7 fig. August, 1922.

Rust Resistance in Winter Wheat Varieties, by L. E. Melchers and John H. Parker. U. S. Dept. Agr. Bul. 1046, 32 p., 11 pl., 2 fig. Bibliography, p. 30-32. Issued May, 1922.

Alternate Hosts and Biologic Specialization of Crown Rust in America, by I. E. Melhus, S. M. Dietz, and Florence S. Miller. In Iowa Agr. Exp. Sta. Research Bul. 72, p. 211-236, 2 fig. Bibliography, p. 235-236. January, 1922

The Determination of Biologic Forms of Puccinia graminis on Triticum spp., by E. C. Stakman and M. N. Levine. Minn. Agr. Exp. Sta. Tech. Bul. 8, 10 p., 1 fig. Literature cited, p. 10. Issued July, 1922.

Smuts

The Wheat Bunt Problem in Oregon, by D. E. Stephens and H. M. Woolman. Oreg. Agr. Exp. Sta. Bul. 188, 42 p., 5 fig. Issued February, 1922.

MANUSCRIPTS IN PRESS, DECEMBER 31, 1922

On December 31, 1922, the following 58 manuscripts, resulting from the work of the Office of Cereal Investigations, were in press, scheduled for publication in the various series of Departmental publications, in the bulletin and circular series of the cooperating State agricultural experiment stations, and in private journals.

AGRONOMIC SUBJECTS

Corn

The Influence of Spacing on Productivity in Single-Ear and Prolific Types of Corn, by E. B. Brown and H. S. Garrison. Submitted July 13, 1922, for publication in the Departmental Bulletin series.

The Story of Corn, by H. S. Garrison. Submitted April 10, 1922, for publication in Agricultural Cyclopedia for Young People.

Effects of Selection on the Yield of a Cross between Varieties of Corn, by F. D. Richey. Submitted July 6, 1922, for publication in Departmental Bulletin series.

Wheat

The Inheritance of Growth Habit and Resistance to Stem Rust in a Cross between Two Varieties of Common Wheat, by C. S. Arnold. Submitted July 7, 1922, for publication in the Journal of Agricultural Research.

The Wheat Situation in the Northern Great Plains Area, by C. R. Ball. Submitted December 16, 1922, for publication in Proceedings of Land-Grant College Association.

Wheat, by J. Allen Clark and C. E. Leighty. Submitted April 10, 1922, for publication in Agricultural Cyclopedia for Young People.

The Durum Wheats, by J. Allen Clark and John H. Martin. U. S. Dept. Agr. Farmers' Bul. 1304. Submitted March 24, 1922; galley proof read October 16.

The Club Wheats, by J. Allen Clark and John H. Martin. U. S. Dept. Agr. Farmers' Bul. 1303. Submitted March 24, 1922; galley proof read October 24; page proof read November 10.

The Common White Wheats, by J. Allen Clark, John H. Martin and Clyde E. Leighty. U. S. Dept. Agr. Farmers' Bul. 1301. Submitted April 10, 1922; galley proof read October 4; page proof read October 25.

A Study of Rust Resistance in a Cross between Marquis and Kota Wheats, by H. K. Hayes and C. S. Immelt. Submitted December 4, 1922, for publication in the Journal of Agricultural Research.

The Soft Red Winter Wheats, by Clyde E. Leighty and John H. Martin. U. S. Dept. Agr. Farmers' Bul. 1305. Submitted July 20, 1922; galley proof read October 13; page proof read November 17.

Polish and Poulard Wheats, by John H. Martin. Submitted Nov. 27, 1922, for publication as a Farmers' Bulletin.

Experiments in Wheat Production on the Dry Lands of the Western United States, by D. E. Stephens, M. A. McCall, and A. F. Swecker. Submitted August 31, 1922, for publication as a Department Bulletin.

Oats

Oats, by T. R. Stanton. Submitted April 10, 1922, for publication in Agricultural Cyclopedia for Young People.

Naked Oats, by T. R. Stanton. Submitted December 14, 1922, for publication in the Journal of Heredity.

Barley

The Water Content of Barley Kernels During Growth and Maturation, by H. V. Harlan and Merritt N. Pope. Submitted Nov. 5, 1921, for publication in Journal of Agricultural Research.

Many-noded Dwarf Barley, by H. V. Harlan and Merritt N. Pope. Submitted July 6, 1922, for publication in The Journal of Heredity.

Rice

Rice, by Charles E. Chambliss. Submitted April 10, 1922, for publication in Agricultural Cyclopedia for Young People.

Some New Varieties of Rice, by Charles E. Chambliss and J. Mitchell Jenkins. U. S. Dept. Agr. Bul. 1127. Submitted April 20, 1922; galley proof read September 30; page proof read October 28.

Rice Experiments on the Biggs Rice Field Station in California, by Jenkin W. Jones. Submitted November 2, 1922, for publication as a Department Bulletin.

How to Grow Rice in California, by Jenkin W. Jones. Submitted December 2, 1922, for publication in the Farmers' Bulletin series.

Grain Sorghums and Broomcorn

Grain-Sorghum Experiments at the Woodward Field Station, Woodward, Okla., by John B. Sieglinger. Submitted Nov. 28, 1922, for publication as Department Bulletin.

Minor Cereals

Buckwheat, by C. E. Leighty. Submitted Aug. 24, 1922, for publication in Agricultural Cyclopedia for Young People.

Rye, by C. E. Leighty. Submitted August 24, 1922, for publication in Agricultural Cyclopedia for Young People.

Flax

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PROJECT REPORTS

RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Pathologist in Charge)

Barberry Eradication, (Dr. F. E. Kempton, Pathologist in Charge)

PROGRESS OF BARBERRY ERADICATION, 1922

Marked progress has been made in all phases of the barberry eradication campaign during 1922. With the increased Federal appropriation which became available July 1, and with excellent weather conditions for field operations, an area equivalent to 197 counties was surveyed in the 13 cooperating States. This includes 15 counties in Minnesota and one county in Iowa which were surveyed on State funds. A total of 209,397 bushes were located on 5,918 properties and 729,721 bushes were removed from 6,408 properties. Of these, 500,000 were bushes 6 to 18 inches in height which had been found and reported previously in one woodland in Grant County, Wis.

Excellent cooperation has been extended by farmers and other individual property owners, by newspapers, and by organizations of bankers, business men, railroad officials, millers, etc. County farm organizations have shown their increased interest in the campaign by urging that their counties be surveyed as soon as possible. Demonstration material has been furnished to each State and used to advantage at State and county fairs and other public gatherings.

Through the cooperative efforts of the Conference for the Prevention of Grain Rust, an organization composed of the Governor, the Commissioner of Agriculture, a representative of the State Agricultural Experiment Station, and the President of the State Farm Bureau Federation or corresponding farmers' organization of each State interested, and an additional membership at large composed of representatives of milling associations, railroads, implement dealers, bankers, National farmers' organizations, and other business interests, much assistance has been given in sending publicity material to all classes of people in the barberry eradication area. This included charts with samples of barberries, calling attention to the losses caused by this shrub, placed in banks, railway stations, elevators, and other public buildings in most of the cities and towns of the 13 States. Because of the special interest of these organizations, individual property owners have cooperated even better than in the past.

Rust Spreads from Bushes

Intensive studies have been made of the spread of rust from barberries to surrounding fields of grains and grasses. These areas of local rust epidemics have been mapped and the degree of infection noted at various distances from the barberry bushes. Several of these local epidemics in the vicinity of Northfield, Minn., spread until they met in one extensive epidemic. At Burlington, Colo., 12 bushes

were responsible for an epidemic that spread from 3 to 5 miles on each side of the town. Near Alert, Decatur Co., Ind., one barberry bush was responsible for the almost complete destruction of wheat in two nearby fields and lesser losses in an area of 20 square miles. Farmers estimated that the financial loss caused by this one bush during the summer of 1922 was at least $12,000.

Hunting Rust with Airplanes

Airplanes were used to ascertain how far rust spores were distributed by air currents. This investigation was made possible by the cooperation of the Air Service of the War Department, which furnished planes and pilots. Flights were made from fields at San Antonio, Texas; Fort Crook, Omaha, Nebr.; Fort Sill, Okla.; Minneapolis, Minn. (in cooperation with the Minnesota National Guard); Chanute Field, Rantoul, Ill.; McCook Field, Dayton, Ohio; and Camp Knox, Louisville, Ky. Spores of stem rust were found in the air at altitudes of from 1,000 to 10,000 feet. Spores which were caught at altitudes ranging from 1,000 to 7,000 feet germinated fairly well. The average percentage of spores which germinated was 11.2. It is significant that the number of spores caught in the air decreases rather rapidly as the distance from rusted grains and grasses increases. There was no evidence that any appreciable amount of rust developed in the barberry eradication area as a result of spores blown from the South. As far as observations go, in the barberry eradication area, the only rust which had developed by the end of the first week in June clearly came from local barberries, from which rust already had been traced directly in some localities to a distance of at least a mile and a half. Apparently, epidemics developing in the barberry eradication area result from spores blown from local infection areas near barberries rather than from spores blown from the South.

Escaped Barberry Bushes

The spread of escaped barberries to open woodlands, fence rows, rocky ledges, brushy pastures, and stream banks has become the most serious problem of the campaign. During the past year, 133,365 escaped bushes have been found on 850 properties. The great number of these were in the States of Michigan, Ohio, Illinois, Wisconsin, Minnesota, and Iowa. During the entire campaign, 3,760,351 barberries were found on farms, only 331,801 of which were cultivated while 3,428,550 have been escaped bushes. These areas are being carefully mapped in order to facilitate the complete eradication of seedlings and sprouts. All bushes in representative areas in Iowa, Wisconsin, Illinois, Michigan, and Ohio have been treated either with rock salt or sodium arsenite as trials of that method of eradicating escaped barberries.

Resurvey

A complete resurvey has been made in 201 of the 276 counties surveyed in previous years, and a resurvey also has been made in all cities and towns covered in the original farm-to-farm survey. In this resurvey, 33,740 sprouts and thousands of seedlings were found and removed during the past year. It has become evident that several resurveys will be necessary. If the entire root system is not removed when barberry

bushes are dug, sprouts may grow even from small bits of the roots which are left in the soil. To go back after a bush has been dug and find all of these sprouts is difficult and expensive. Furthermore, it is almost impossible to remove all of the roots which have entwined with the roots of trees or which have grown into the crevices between rocks. In those areas where there are many escaped bushes, tremendous numbers of seedlings also may appear as long as three years after the bushes have been dug. To destroy all of these seedlings by digging is almost impossible. Attempts therefore have been made to kill the bushes by means of chemicals.

Killing Bushes with Chemicals

Experiments on chemical methods of eradication were begun in September, 1921. About 40 different chemicals were tried on large barberry bushes in the field. Two chemicals, rock salt and sodium arsenite, have given uniformly good results, meeting the 3 chief requirements, namely, availability, cheapness, and effectiveness. Crushed rock salt fulfills all these requirements. For the average-sized barberry, 10 pounds of rock salt piled around the base is certain death. It may be applied at any time of the year. A dilute solution of sodium arsenite, one pound to 5 gallons of water, applied at the rate of 2 gallons per bush as a drench at the base has been found to be effective when applied at any time in the growing season, but its action when applied in the late fall and winter is not yet fully determined.

Barberry Bees

Barberry bees or eradication days have been organized to rid some communities of all barberries, especially in areas where many barberry bushes have escaped from cultivation or where large barberry hedges occur. These gatherings serve not only to get the barberries removed but to educate the members of the community on the relation of barberries to stem rust and give valuable publicity to the campaign. Such bees were held near Pine Island, and Red Wing, Minn., Mingo, Ohio, and Alert, Ind.

Five-Year Results

During the five years, 1918 to 1922, practically all cities and villages of the 13 States within the quarantine area have been surveyed. In the original farm-to-farm survey, an area equivalent to 472 counties has been covered. This includes 39 counties surveyed on funds furnished by States. During this 5-year period, 5,829,368 bushes have been found in the different States, as follows: Colorado, 24,001; Illinois, 142,872; Indiana, 96,284; Iowa, 764,096; Michigan, 265,109; Minnesota, 772,977; Montana, 9,027; Nebraska, 38,862; North Dakota, 19,438; Ohio, 230,083; South Dakota, 52,303; Wisconsin, 3,394,153; Wyoming, 4,140. The removals total 5,173,547 bushes. The remaining two-thirds of a million are mostly in one or two small areas of escaped bushes and most of them are seedlings.

Table 1 shows the survey results by States for the calendar year, January 1 to December 31,1922. Table 2 shows the survey results by States for the 5-year period, April 1, 1918, to December 31,1922. Table shows the results by calendar years for the 5-year period, April 1, 1918 to December 31,1922. Table 4 shows the number of counties covered in the original farm-to-farm survey by States for 6-months periods, January 1, 1919, to December 31,1922, with totals for fiscal years and calendar year

Table 1, Data showing, by States, the number of properties on which barberry bushes were found and the number of bushes located and removed in the barberry eradication campaign from January 1 to December 31, 1922.

State	Number of properties on which bushes were found				Cleared of bushes	Number of bushes					Sprouts found and removed on the reservey of 61 counties
	In cities and towns	In country		Total properties		In cities and towns	In country		In both cities and country		
		Escaped	Total				Escaped	Total	Found	Removed	
Colorado	27	11	19	46	46	360	1,004	1,093	1,453	1,365	2,458
Illinois	675	112	285	960	1,312	4,269	1,828	3,824	8,093	14,889	1,029
Indiana	116	59	229	345	349	629	3,901	7,921	8,550	7,662	14,577
Iowa	94	151	595	690	672	917	12,750	31,439	32,356	29,652	21,628
Michigan	330	141	496	826	924	5,083	77,517	88,750	93,833	101,212	841
Minnesota	202	142	649	851	874	2,890	21,987	54,779	57,669	55,716	23,513
Montana	4	1	5	9	2	81	41	264	345	9	256
Nebraska	41	26	213	254	246	245	2,636	4,383	5,228	5,246	8,145
No. Dakota	21	0	91	112	112	185	0	2,138	2,323	2,323	1,132
Ohio	640	25	363	1,003	1,084	3,444	833	3,777	7,221	11,071	2,183
So. Dakota	28	19	141	169	163	284	1,772	5,990	6,274	8,394	2,522
Wisconsin	230	147	423	653	600	1,117	3,676	4,935	6,052	509,393	3,435
Wyoming	0	0	0	0	24	0	0	0	0	2,792	16
Total	2,403	830	3,509	5,918	6,408	19,504	133,365	189,893	209,397	729,721	92,740

Table 2. Data showing, by States, the number of properties on which barberry bushes were found and the number of bushes located and removed in the barberry eradication campaign from April 1, 1918, to December 31, 1922

State	Number of properties having bushes					Number of bushes					Estimated Years area cleared in the resurvey
	In cities and towns	In country		Total properties	Cleared of bushes	In cities and towns	In country		In both cities and country		
		Escaped	Total				Escaped	Total	Found	Removed	
Colorado	1,526	30	116	1,642	1,639	19,532	2,415	4,469	24,001	23,822	5,684
Illinois	8,399	458	1,079	9,478	9,085	96,769	27,463	46,113	142,832	129,736	3,303
Indiana	3,252	114	761	3,966	3,923	75,917	8,074	20,367	96,284	94,004	17,037
Iowa	6,779	356	1,611	8,390	8,365	643,461	50,966	120,635	764,096	761,227	35,130
Michigan	4,204	1,046	4,121	8,325	6,490	44,443	194,477	220,686	265,109	221,090	1,030
Minnesota	2,980	357	1,650	4,630	4,611	591,624	75,496	187,353	778,977	776,803	38,940
Montana	156	2	43	204	196	6,658	42	2,369	9,027	8,630	4,771
Nebraska	3,019	43	478	3,497	3,153	71,541	5,221	17,321	88,862	88,180	11,421
No. Dakota	495	1	236	731	731	14,265	150	5,173	19,438	19,438	1,623
Ohio	5,130	90	918	6,048	5,402	200,564	20,627	29,524	230,088	210,436	4,469
So. Dakota	409	30	430	839	739	22,507	16,179	29,802	52,309	47,302	4,990
Wisconsin	6,157	614	1,363	8,020	7,580	277,790	3,067,439	3,076,365	3,354,155	2,758,336	15,521
Wyoming	14	1	13	27	73	3,345	1	134	4,140	3,841	256
Total	42,580	3,192	13,264	55,844	51,992	2,069,017	3,428,550	3,760,351	5,829,364	5,173,347	144,337

Table 3, Data showing, by calendar years, the number of properties on which barberry bushes were found and the number of bushes located and removed in the barberry eradication campaign from April 1, 1918, to December 31, 1922.

Calendar Years	Number of properties having bushes					Number of bushes					Sprouts found and removed in the resurvey
	In cities and towns	In country		Total properties	Cleared of bushes	In cities and towns	In country		In both cities and country		
		Escaped	Total				Escaped	Total	Found	Removed	
1918	22,044	127	1,166	23,210	16,764	1,665,898	77,438	176,341	1,842,239	1,690,475	
1919	14,104	1,298	4,611	18,715	16,848	337,246	1,680,806	1,758,817	2,096,063	2,025,339	11,048
1920	1,253	384	1,675	2,928	5,635	13,103	1,436,282	1,492,904	1,506,007	518,315	22,593
1921	2,770	553	2,303	5,073	6,337	33,266	100,659	142,396	175,662	209,647	21,956
1922	2,409	830	3,509	5,918	6,408	19,504	133,365	139,893	209,397	729,721	88,740
Total	42,580	3,192	13,264	55,844	51,992	2,069,017	3,428,550	3,760,351	5,829,368	5,173,547	144,337

Table 4, Data showing, by States, in fiscal and in calendar years, the progress of the county survey in barberry eradication from January 1, 1919, to December 31, 1922.

Original farm-to-farm survey only

State	Total counties In State	Total counties Requiring Survey	Numbers of Counties Surveyed in Fiscal and Calendar Years: 1919 Jan.-June	1919 July-Dec.	1920 Jan.-June	1920 July-Dec.	1921 Jan.-June	1921 July-Dec.	1922 Jan.-June	1922 July-Dec.	1923 Jan.- June	Total counties Survey completed	Remaining to be surveyed
Colorado	63	32	0	12	1	8	6	0	0	3		30	2
Illinois	102	102	0	1	0	3	2	3	0	6		15	87
Indiana	92	92	0	12	1	6	5	6	2	17		49	43
Iowa	99	99	0	1	0	15	3	14	0 Fed. 1 St.	29 Fed. 0 St.		62 Fed. 1 St.	36
Michigan	83	69	0	0	0	5	1	5	0	9		20	49
Minnesota	86	86	0	3	0	9	3	11 *Fed. 23 St.	0	10 Fed. 15 St.		36 Fed. 38 St.	12
Montana	54	12	2	6	0	2	0	0	0	2		12	0
Nebraska	93	89	0	6	1	10	4	12	3	29		65	24
No. Dakota	53	50	0	4	0	7	3	7	0	16		37	13
Ohio	88	88	0	0	1	7	1	6	1	13		29	59
So. Dakota	78	74	0	1	0	7	1	11	1	23		44	30
Wisconsin	70	65	0	0	0	4	1	4	1	16		26	39
Wyoming	23	8	0	0	0	0	5	3	0	0		8	0
Totals	984	886	2	46	4	83	35	82 Fed. 23 St.	8 Fed. 1 St.	173 Fed. 15 St.		433 Fed. 39 St.	394
Totals for fiscal years			2	50		118		90 Fed. 24 St.		173 Fed. 15 St.		433 Fed. 39 St.	394
Totals for calendar years			48		87		117 Fed. 23 St.		181 Fed. 16 St.			433 Fed. 39 St.	394

*Fed. = Federal funds; St. = State funds.